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Submitting articles
Commodore Horizons welcomes readers' contributions — either articles or program listings Articles should be typed double-spaced with a wide margin Programs should, whenever possible, be printed out on plain white paper accompanied by a cassette We cannot guarantee to return every article or program submitted, so please keep a copy If you want to have your program returned you must include a stamped, addressed envelope

SUNSHINE

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EDITORIAL

JACK TRAMIEL IS not reknowned for being a forgiving man He is a pugnacious character who built up Commodore from nothing to a multi-million pound company. Commodore was very much his personal fief

Thus it was a considerable surprise when Tramiel announced his resignation as Commodore's president and chief executive in January this year At the time he claimed that he was resigning for "personal reasons" and that there was no animosity between him and the remaining members of the Commodore board However, subsequent reports suggest that there was an acrimonious split between Tramiel and Commodore chairman Irving Gould over Tramiel's desire to bring his sons into the business

But, following his purchase of Atari for $240m, Tramiel is back And the company sitting in his sights now is undoubtedly Commodore

Whether Tramiel can repeat his extraordinary success with Atari remains to be seen, but he has certainly given Commodore something to think about Atari lost some $539m in 1983, but two years ago it was the hottest property on the microcomputer scene and worth more than $1 5bn With manufacturing plants in the US Hong Kong, Eire and Taiwan, Atari is one of the few companies which could match Commodore's volume of production

Tramiel has already given notice that he intends to move fast by laying off several hundred of Atari's Californian workforce Some industry observers now expect Atari to drop the price of its 800XL micro putting it in direct competition with the Commodore 64

Commodore has now reacted by taking out an injunction against four of its ex-employees who have joined Tramiel at Atari The injunction prevents the four engineers from "using or disclosing in any matter whatsoever any trade secrets or proprietary or confidential information belonging to Commodore "

The stage is now set for a head-on clash between the two companies — and to the victor will go the spoils

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LETTERS PAGE

Bardsoft appeal

WE ARE in the process of establishing a database of software for the handicapped — BARDSOFT. Briefly, each entry to the database will contain a description of the programs, the handicaps they are suitable for, the type of computer system required, name and address of supplier – developer and price, etc. This information will be made available through printouts in answer to specific enquiries.

The aim of BARDSOFT will be to facilitate the exchange of information on software relevant to any aspect of the lives of handicapped people. One major addition will be the concerted effort to promote the database, and therefore the software, abroad. This is what we have been doing successfully for non software products in the field.

As we are currently collecting and processing information, we would be pleased to hear from any of your readership who may wish to contribute to BARDSOFT. For further information please contact me at the above address.

Peter Curran
Bardsoft
Handicapped Persons
Research Unit
Newcastle upon Tyne
Polytechnic
No. 1 Coach Lane
Coach Lane Campus
Newcastle-upon-Tyne

Saving strings

MANY THANKS to John Consadine for his idea for changing program lines under program control (July issue). It was just what I needed for a particular application. Up till now I have used a routine to save data which prints data lines on the screen just before the end of the program, then when the program ends one brings the cursor up to the lines so printed and presses return to add them to the end of the program. However, the following routine may be of interest and will enable a string to be saved as a data statement.

The dummy data line, which must always be the first in the program, must be exactly the same length as the data statement to be saved. Unfortunately this limits the routine to strings of fixed length. (This length must include the commas in the eventual data statement.)

```
5 DATA@@@@@@@@
(Dummy data line)
10 M = PEEK(43) + 256
PEEK(44) + 5 (Start of basic
+ 5)
20 REM START OF MAIN
PROGRAM (start main prog)
30 FORZ = 0TO5
40 PRINTZ
50 NEXTZ
60 REM END OF MAIN
PROGRAM (End main prog)
70 D$ = "1934" C$ = ""
(String to be saved—can be
anything)
80 FORA = 1TOLEN(D$( D
A$ = MID$(D$ A,1) + " " C
$ = C$ + DA$ NEXT C$ =
LEFT$(C$ LEN(C$)—1)
(Insert Commas into D$ and
chop off final comma)
90 FORA = 1TO7 D(A) = ASC
(MID$,C$,A,1)) NEXT
(Convert data items to ASC
values)
100
FORA = 1TO7 POKEM,D(A)
M = M + 1 NEXT (Poke ASC
values into basic memory)
110 REM READ DATA
120 READ
A$ 1FLEFT$(A$,1) = "@"T
HEN PRINT"DATA NOT
SAVED " END (Determine if
data has been saved)
130 RESTORE C$ = ""
(Reset data pointer)
140
FORA = 1TO4 READA$ C$
= C$ + A$ NEXT (Get saved
data into a string)
150 PRINT" D$ IS
",C$ END
```

This routine will run on any expansion VIC20 — Line 10 takes care of this.

Regarding fast load programs such as "Tornado" — I have not tried Tornado but have tried a total of three of Stack's Vickit 4 cartridge which does the same thing, without any success whatsoever. The device will save and verify 100% but in no circumstances will it load the program back into the Vic without corrupting it. Has anyone any suggestions as to what is wrong?

Jim Dunnett
Prestatyn
Clwyd

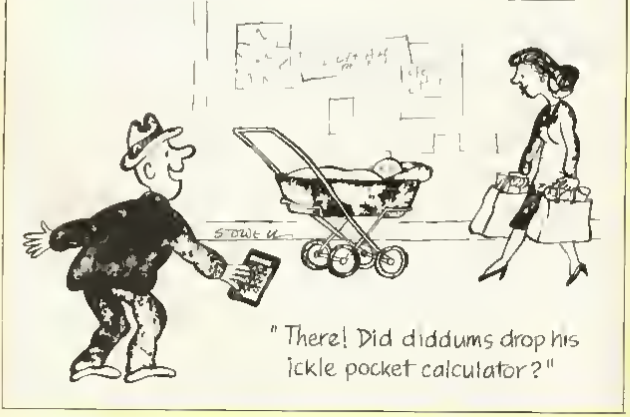
Pubquest plea

I MUST write in support of Ben Arrowsmith and Dee Lakha — charts for the best selling software and ratings for new software would be sure to make Commodore Horizon even more popular.

My main query concerns a certain adventure game called Pubquest by Dream Software. It is a truly excellent text-only game living up to its claims as both witty and unusual. However, it has one slight drawback — it's impossible! I can't find any way of crossing the road from the Chequered Flag Inn. I either get run over or poisoned by needles hidden in Pelican Crossing buttons.

My suspicions is that the answer lies in a cupboard in the above mentioned Pub's W.C., however I cannot find anyway of opening the wretched thing. All my friends agree with me, so could you please publish my query in order to see if any other readers know a solution.

Stuart Powell
Broadsteirs
Kent



This is the chance to air your views — send your tips, complaints and compliments to Letters Page, Commodore Horizons, 12-13 Little Newport Street, London WC2R 3LD

NEWS DESK

Tramiel buys Atari Corp.

THE MICROCOMPUTER industry has been rocked by the news that former Commodore head Jack Tramiel has bought out old rivals Atari

Atari, a subsidiary of the giant Warner corporation, has been losing money for some time due to the success of microcomputers over dedicated games playing machines

Now Tramiel, who left Commodore after an argument with chairman Irving Gould, allegedly over the bringing of Tramiel's sons into the business, has paid $240m for most of Atari. Rather than pay cash, a complicated deal involving shares and stock options has been made by Tramiel's new company

Atari's chairman James Morgan was fired hours after the news of the takeover by

Tramiel not in business to be loved

Tramiel Technology Incorporated All Atari's plans, for a new home computer, an enhanced machine, and work with George "Star Wars" Lucas, are now in doubt Many of the workforce and almost all of the senior executives are expected to leave

Now, although Jack Tramiel will make no comment on his plans for Atari, it seems plain that he intends to fight Commodore, the company he set up, as hard as possible Already the in-fighting has started, as Commodore has accused defecting employees of taking secret material on the planned Commodore Z 8000 machine to Tramiel

Tramiel seems determined to live up to his motto — "I'm not in business to be loved — I'm in business to make money"

K-Tel change

RECORD and software distributors K Tel are to set up a new software subsidiary

The Front Runner label will be launched in September with two games, one of which, Storm Warrior, is a graphic adventure for the 64 Prices are not yet available

There are three 64 games available from K Tel, either on tape or disk Titles include City Attak and Odyssey

Front Runner spokesperson Karen Wake said "We're starting up the new label to indicate that the software division is being run independently to the rest of K-Tel, and we'll be making separate distribution deals There will be several Front Runner games for the 64, but it's too early to give details "

Leeds CBM Show off

THE SECOND HALF of the 5th International Commodore Computer Show, planned to be held in Leeds from 27th — 29th of September, has been cancelled

The 1984 exhibition was arranged in two parts following the success of the previous show However, following poor attendances at the London show in June, plans have been changed

Commodore claims that the reason for the cancellation is the complication caused by the move to Corby A statement from Commodore's PR office said that "rather than staging the Leeds show without a full complment (of staff and resources), we have decided to postpone it for the time being another factor is that we will shortly be embarking on production of the new computers our major priority will be to bring production up to full strength "

Further details of the Leeds show will be given later in the year, but in view of the disappointing turnout in London it seems far from certain whether the show will take place at all The recent Earl s Court and Micro Trade shows also drew poor crowds indicating perhaps that the micro manufacturers will have to find something new for the public to see if the situation is to be improved before Christmas

Granada micros

HIGH STREET TV rental giant Granada has announced plans to sell home computers

Following testing through pilot stores, Granada has decided to market the Commodore 64 and Vic 20, as well as the Sinclair Spectrum and the Electron and BBC B computers

A wide range of computer games, educational software and peripherals will also be sold in over 100 Granada stores Spokesman John Harper said that apart from the basic machines Granada was also looking at peripherals such as printers and disk drives, and planning to market a range of the most popular software

Suitable case from Jenart

JENART DESIGN has solved the problem of transporting your Vic or 64 — whether to the computer club, the music studio, or back to the shop to get it fixed

The Jenart Carrying and Storage case is made in waterproof acrylic and shatterproof ABS plastic padded with foam and constructed with high strength glues and metal joiners The computer slips vertically into one pocket, held in place by the padded lid The datasette and power supply can be stored in another pocket, and there's space enough left for tapes and cables

The case, which includes fastening straps and a carrying handle, costs £19 25 + £3 20 p&p It comes with a Commodore 64 or Vic 20 logo

Jenart also manufactures a range of dustcovers, including a Commodore model at £3 20 + 30p p&p, along with cases and covers for all the popular micros

Contact Jenart at 19, Spire Lake, Bishops Nympton, South Molton, Devon, EX36 4NY, tel Bishops Nympton 693

Now all we need is a case for the disk drive

Jenart — just in case

Corby on stream

***Chris Jenkins** visits Commodore UK's new Corby HQ and talks to production manager David Briggs*

A NEW ERA for Commodore UK will start at the beginning of August, when the new Corby manufacturing facility comes into full production.

Commodore's Slough headquarters have long been too small for the rapidly expanding company, and with the help of government development grants the £6m Corby plant has been set up to allow for further growth.

At the same time Commodore UK will go into production of the Vic and 64, and later the Plus/4 and C16. Commodore micros have previously been manufactured in Braunschweig, West Germany.

Interviewed at the Corby site, production manager David Briggs said that the move was going according to plan. "The satellite factory was completed in May, and has been in production since July. The service department is also fully operational."

David Briggs — 'going well'

All departments, including sales and marketing, will be housed in the giant main factory once that building is completed. Only external work now remains to be done.

Corby, situated near Kettering, has been an unemployment blackspot since the closure of the British Steel works some years ago. Now Commodore, and other electronics companies such as RS Components, is bringing life back to the area. 140 people have been employed on the assembly lines already, and the full complement should number 200.

Despite some initial apprehension about the move, David Briggs claims that some Slough employees saw the advantages of Corby. "Housing prices are cheaper and you're only five minutes drive from the countryside."

For Commodore micro users, the advantages of having manufacturing and service facilities on one site are obvious. "We've knocked together a 20,000 and a 30 000 square foot warehouse to set up the assembly lines. The cases, keyboards and PCB's come in assembled, and we burn in the circuits for four hours, assemble the units and test the keyboards, then test the whole unit again before passing it to packing and dispatch. We also have roving quality inspectors on the assembly lines."

Production of the 64 is already on 5 000 per day. However, there is as yet no production of the Vic, Plus/4 or C16, and David Briggs declined to comment on whether the new machines would be ready in large quantities for Christmas.

Tape duplication stays with outside contractors, although disks will be produced at Corby. There are no plans for the production of cartridges, or for peripherals, which will continue to be made overseas.

Corby warehouse packed with 64 s for dispatch

Video giants hit 64

TWO GIANT video games corporations are set to enter the 64 software market

Parker's titles include Star Wars, based on the George Lucas film, Gyruss, a complex space arcade game, Mr Do's Castle, a "ladders" game and versions of the arcade favourites Popeye and Q*Bert. All the games will be available on disk only in September. European product manager Rae Potter comments "Already we are seeing a marked increase in the disk drive penetration of mid-range home computer users." The bad news — the games will cost around £24.95

Activision's plans begin with Pitfall 2, a follow-up to the popular videogame Pitfall. Again the hero is Pitfall Harry, this time searching a tomb for treasure and his missing niece. Tape version costs £9.99, but the disk price has yet to be announced

Already available are Beam rider, Pitfall and Decathlon. These are adapted and enhanced versions of video game originals

Forthcoming titles include Zenji, H E R O, Toy Bizarre and River Raid. All the Activision games should be available by late Summer

Dataview value

BUSINESS software specialists Dataview have released a high-quality word processor and compiler for the 64

Spokesman Sid Newman explained "Wordcraft 64 is a version of a program developed for the 8000 series. On the 8000's it costs £425 — on the 64 version, which retains most of the features, it only £49.95 on disk. Although it's a forty-column program, it has full screen scrolling, colour control and all the features you'd expect of a top-quality word processor

"The Jet Pack DTL Compiler comes in two versions — a tape costing £14.95, which allows up to 12K of object code to be compiled, and a £39.95 disk which has no restrictions since the program can spool in and out of the disk. The disk version also has special routines for sprite movements

For further details contact Dataview at Portreeves House, East Bay, Colchester, phone 0206-865835

Commodore staff on the move

WITH THE MOVE TO the new Corby plant Commodore will make a number of changes in management structure

John Baxter, marketing manager, is leaving to work with Andromeda Software. Andromeda has a growing reputation as importers of Hungarian games software (see *Commodore Horizons*, May)

Although Commodore is "actively looking" for a replacement, no appointment has been announced at the time of writing

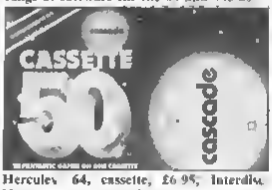
Gail Wellington, software products manager, will not be moving to Corby. UK managing director Howard Stanworth commented that "Gail Wellington will be working as the European software co-ordinator for Commodore Electronics, at a site not yet decided. Her job will be to check the suitability of software, not just for the UK market but for overseas distribution"

Baxter on the move from CBM

The Corby move will mean redundancy for a number of junior clerical staff at Slough, but in Howard Stanworth's words "We'll be taking with us almost all those who regard their work with Commodore as a career rather than just a job"

SOFT*HITS*SOFT*HITS*SOFT*HITS

THIS BRIEF round-up of software releases will be extended next month into a whole new section of Commodore Horizons. From now on we'll be looking at more software and bringing you more screen shots, so that readers will get the widest possible coverage of the rapidly expanding range of software for the 64 and Vic 20



Hercules 64, cassette, £6.95, Interdisc. New company, new idea — fifty frames of arcade adventure set in mythical Greece

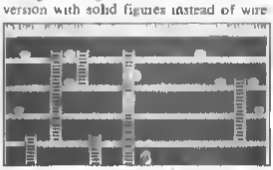
Cassette 50, 64/Vic, cassette, £9.95, Cascade. Great value — 50 Basic games on one tape. Mazes, Space Invaders, even simple adventures: quality comparable to good magazine listings. You can break into the programs to study programming techniques

Stranded, 64, cassette, £9.95, English Software. Graphic adventure with 35 screens. As Special Agent Sid you have to find your missing spaceship and escape from a strange planet

Murphy, 64, cassette, £7.95, Mogul. Mogul games get better and better — this one's a fast moving underground arcade extravaganza with robbers and runaway wagons standing between you and the bags of gold

Blue Thunder, 64, cassette, £6.95, Richard Wilcox. Fair adaptation of the Spectrum original. Pilot your jetcopter against a series of enemies to rescue your comrades from the threat of an unstable reactor

Encounter, 64, cassette £9.95, disk £12.95, Novagen. A goodie — 3-D Battlezone version with solid figures instead of wire



frames. Fast-moving "through the window" action as you pilot your battle tank across a planetary surface littered with mysterious obelisks. Brain-numbing 2001-style spacewarp sequence makes this one a must

Bonzo, 64, cassette, £5.95, Audiogenic. Nice "ladders" game in which you control a workman collecting boxes threatened by intelligent monsters

Shopper, Vic + 8K, cassette, £1.99, Mastertronic. Might be a goodie from the kings of the cheapo games, but I haven't been able to get past the first screen yet! At this price, how can you say no?

Guardian, 64, cassette, £6.95, Alligata. Excellent implementation of the arcade classic Defender. Humanoids, landers,

mutants, pods, swarmers, baiters and bombers fill the air. Great sound effects, superb graphics and animation. Grease your joystick and get it

Omega Run, 64, £6.95, cassette, CRL. Wai flight simulator in which you must fight off enemy planes, searchlights, anti-aircraft fire and missiles to reach your target. Converted from the Spectrum version — surprisingly not as good as the original

Next month's New Releases section will feature more games, more screen shots, and details of new utility and business packages too

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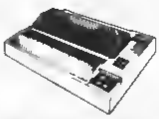

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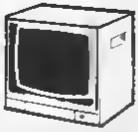

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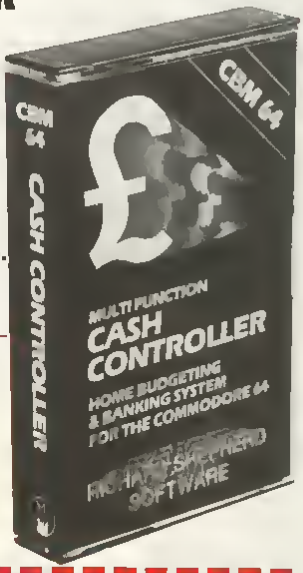

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Living with your 1541

Theory and practice of the 1541 disk drive from ***David Lowrence*** *and* ***Mark England's*** *Disk Companion*

DISK STORAGE, like tape storage, depends on the fact that a thin layer of a ferrous metal compound is capable of being magnetised and demagnetised. When magnetised by proximity to a magnetic field, such compounds have the capacity to maintain their magnetised state.

When spread thinly, tiny amounts of such compounds are capable of recording the fact that an electromagnet has passed near to them, the degree of magnetism it possessed and the direction of the current in it. Having been magnetised, the film can be read by an electromagnet which has no current being fed through it, since it is a property of electromagnets that they produce an electric current when passed through a magnetic field — even the minute field stored by a thin film of ferrous compound.

Provided, then, that an electromagnet can be made to pass over the film sufficiently closely, and the state of the electromagnet can be changed in a controlled manner, and provided that this can be done with sufficient accuracy that the same position can be returned to time and time again, then the magnetic qualities of a thin layer of a ferrous compound can be used to store information.

In the context of a computer disk drive, the film of ferrous compound is held on the surface of a 5¼ inch piece of thin, flexible plastic. The electromagnet is provided by the disk drive in the form of a tiny magnetic recording head capable of being moved with great accuracy in a straight line between the centre of the disk and its circumference. The movement of the head over the film is provided by the revolving of the disk. In essence then, a disk system consists of a revolving disk and an electromagnet which can scan in and out across it as it moves.

Information

The advantage of this system compared to tape is not simply the speed with which a single block of information can be stored — some tape systems are very fast indeed. The real power of the disk system lies in the speed at which it can *find* the information or the place where it is to be stored. A good analogy is the difference between an ordinary audio cassette recorder and a long playing record. Provided that in both cases you know where the information you want is stored, ie which track of an album you wish to play, the disk will provide you with much faster access since you are able to move the needle directly in towards the centre of the turntable until it is positioned correctly. Once there, another kind of movement, ie the revolutions of the disk itself, allows you to recall what you want. With the tape system, you have only one kind of movement available to you and you will have no choice but to fast-wind until the correct place is found.

Formatting

Unlike a long playing record, the disks used by the 1541 disk drive do not come with individual tracks laid out in a permanent form. The film recording medium is, or should be, of a uniform consistency over the whole of the disk's surface. Dividing up the disk into easily identifiable 'tracks' for the storage and retrieval of data is a task undertaken by the disk drive itself in a process called 'formatting'.

The purpose of the formatting process is to mark the disk magnetically with a series of areas called 'sectors', roughly three quarters of an inch long. Sectors fall into rings which, as with long playing records, are known as tracks, thirty-five of them in all, with the number of sectors varying according to the distance of the track from the centre of the disk — the further from the centre, the longer the track and the more sectors it will contain.

This simple process is accompanied by some more subtle ones which will enable the finely tuned disk-drive mechanism to identify its place on the disk and move the recording head. Each sector is created with an area of 256 bytes for the storage of data but also has written into it other information, such as the identification number of the disk, the number of the track on which the sector falls, and the number of the sector within the track, plus some standard data which the disk drive will later use to check that it is properly synchronised with the disk as it turns.

Apart from the blank sectors prepared for the reception of data, an area of the disk (track 18) is reserved for the use of the 'directory' or list of files which the disk will eventually contain. When the disk is first formatted, only the first two sectors of track 18 will be used for this purpose — other sectors will be brought in as programs are added. Included in the directory is an area of housekeeping information known as the Block Allocation Map. The purpose of the BAM is to record, for every sector on the disk, whether that sector is available for the storage of information or if it is occupied by part of an existing file.

Sector Zero

The BAM is positioned in the first sector (sector zero) of track 18 and consists of 140 bytes of disk space. This space is itself divided up into 35 sets of four bytes each. The first byte of the group indicates the number of sectors available on one of the disk's 35 tracks. The next three bytes record the state of sectors 0—7, 8—16, and▶

TRACK = 15

0	SEQ F	,PRG BLOCK 2
1	EOF F	,PRG BLOCK 2
2	LIST T&S F	,PRG BLOCK 14
3	APRICOT F WOW	,SEQ BLOCK 1
4	LIST T&S F	,PRG BLOCK 12
5	SEQ ARRAYS F	,PRG BLOCK 4
6	TEST1	,SEQ BLOCK 1
7	SCREEN SAVE	,PRG BLOCK 1
8	PROG READ	,PRG BLOCK 1
9	SCREEN	,PRG BLOCK 1
10	SEQ F	,PRG BLOCK 3
11	EOF F	,PRG BLOCK 3
12	SEQ ARRAYS F	,PRG BLOCK 3
13	SEQ ARRAYS F	,PRG BLOCK 5
14	LIST T&S F	,PRG BLOCK 13
15	SCREEN	,PRG BLOCK 3
16	LIST T&S F	,PRG BLOCK 11
17	SCREEN	,PRG BLOCK 4
18	PROG READ	,PRG BLOCK 2
19	SCREEN	,PRG BLOCK 2
20	SEQ F	,PRG BLOCK 4

Figure 1: allocation of sectors on a typical track

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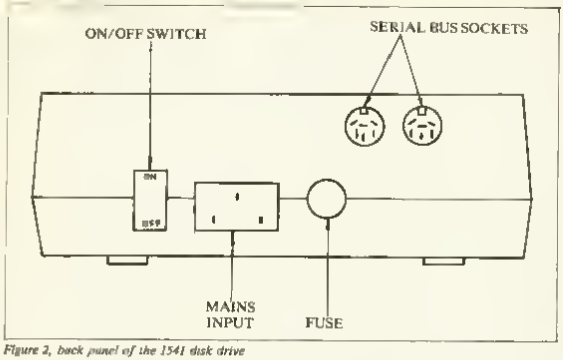


Figure 2, back panel of the 1541 disk drive

◄17—23 of the corresponding track If sector zero of the corresponding track is available for storage, for instance, but zero of the value stored in the second of the four bytes will be 'set' (ie equal to one rather than zero) If the value of a whole byte (ie eight bits) is zero, so that none of its bits is set, this would indicate that the eight sectors it is recording are all in use by a current file You may note that the BAM makes provision for recording 24 sectors (0—23), even though there is a maximum of 21 on the long outer tracks and less as the tracks near the centre The RAM overcomes this potential difficulty by registering these non existent tracks as unavailable when the disk is formatted

Directory

If there are more than eight files on the disk then another sector of track 18 will need to be added to the directory The last sector of the directory is indicated by the fact that the first two bytes, which normally indicate the address of the following sector, point to track zero, sector 255, which does not exist

Having set up the disk structure and the initial directory, the disk is now ready for the storage of information in units which are known as 'files' The two types of file which are used most often are the program file, which is what is created when a program is SAVEd, and the sequential file, which is created when a file is OPENed for the storage of items of data Both these types are stored on the disk in exactly the same way, so we shall take for an example the SAVEing of an ordinary program file

This is the sequence of events involved in SAVEing a program file

1) The SAVE command is entered by the user and the 64 instructs the disk drive to open a program file of that name

2) The disk drive checks its directory to see that a file of that name does not already exist

3) Provided that there is no file of the same name, the disk drive records the filename in the directory with a starting track and sector of 0,255 — ie a non existent track

4) Using the BAM, which is always kept in the disk drive memory, the drive begins to search for the nearest track to the directory track, either out towards the edge of the disk or in towards the centre, which has a free sector (SECTOR1) and marks that sector as allocated in the BAM

5) Having found SECTOR1, the drive records its position and then accepts 254 bytes of the program from the 64 and places them into a buffer in the disk memory

6) Another search is now made for the nearest free sector other than the one discovered in step 4 (SECTOR2)

7) The address of SECTOR2 (discovered by step 6) is now written into the first two bytes of the disk buffer created in step 5

8) The whole of the contents of the buffer are now written into SECTOR1 (discovered in step 4)

9) SECTOR2 is now regarded as SECTOR1 and the process is repeated from step 5 until the 64 informs the disk drive to close the file, by which time the whole of the program has been received

10) For the final bufferful of data, the address of the next sector (the first two bytes) is set at track zero, sector 255, to mark the end of the file

11) The directory entry for the new file is altered to record the sector used for the beginning of the file and the number of bytes contained in the file

By the time programs have been written to the disk, removed and overwritten during the course of time, the structure of the disk will appear most confused to the human eye, with a mishmash of sectors on each track allocated to a variety of programs Provided that nothing happens to corrupt the directory, however, or the two bytes at the beginning of each sector which record the position of the next sector of the file, the disk drive will always be able to find the start of a file that it holds and read that file sector by sector without difficulty An indication of the kind of disk structure that will be found on a well-used disk is given by table 1 The table displays the contents of a single track of one of the disks used in the development of the book

Powerful

So far, we have looked at disks and their layout but taken the activities of the 1541 drive itself for granted It would be wrong to conclude this article, however, without a reminder that the 1541 is an extremely sophisticated and powerful piece of equipment, driven by a 6502 microprocessor and its own internal Disk Operating System program which is as large as the ROM of the 64 itself The advantage of this is that, unlike disk drives for the majority of other personal microcomputers, the use of the 1541 drive requires no memory to be set aside by the host computer to run it Rather than relying on the 64 for detailed instructions as to the handling of its affairs, the 1541 normally requires only to be informed of the name of the task to be carried out It will then proceed without further help on one of the complex procedures it is capable of performing For this reason, the 1541 is known as an 'intelligent drive'

To operate a disk system you need an►

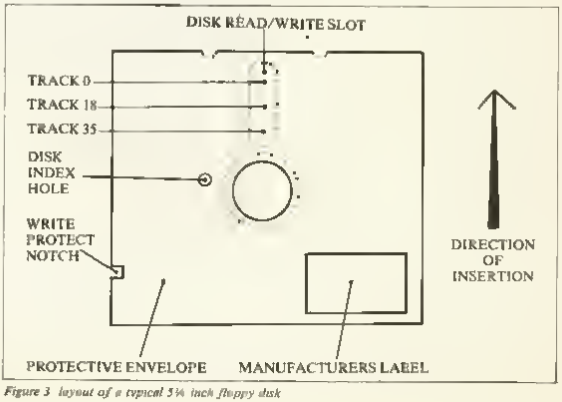
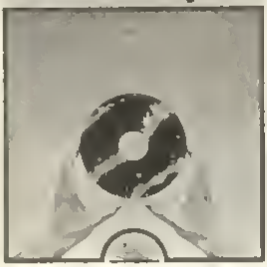


Figure 3 layout of a typical 5¼ inch floppy disk

commodore 64 disk companion

essential routines for commodore disk users

david lawrence and mark england



◄least one 1541 disk drive, together with a connecting lead, to add to your existing system. You will also require a set of 5¼ inch floppy disks — these normally come in boxes of ten but can be bought singly. It should not be forgotten that you will also require an extra power socket from which to run the disk drive.

Procedure

Assuming that your 64, its power unit and the television – monitor which you normally use are all properly connected, and that the power is OFF to all the equipment, follow this procedure.

1) Turn the 64 around so that the back of the machine faces you.

2) Reading from right to left, you will find two rectangular slots in both of which may be seen the edge of the 64's printed circuit board.

3) To the left of these two slots are two circular plug sockets. The one on the right is a six-pin socket and is called the serial bus. It is the means by which the 64 communicates with outside devices such as printers and disk drives.

4) If you have a printer connected to the serial bus socket, disconnect it for the time being.

5) Plug into the serial bus socket one of the small round plugs (DIN plugs) on the connecting lead which came with the disk drive.

6) You can now turn the 64 round so that the keyboard is again facing you.

7) Take the disk drive and place it next to the 64 so that its back is facing you.

8) On the back of the 1541 you will find the connections shown in figure 2.

9) Take the other end of the connecting cable you have just plugged into the back of the 64 and plug it into either of the sockets marked 'SERIAL BUS' in the illustration.

10) If you have a second disk drive, plug its connecting cable into the other socket. (If you wish to operate more than one drive you will also have to alter the device number of one of the drives if the drives have not been permanently modified.) A whole series of drives can be chained in this way if desired.

11) If you have a Commodore compatible printer, you may now connect it to the spare serial bus socket on the last disk drive to be connected to the system.

12) Ensure that the 1541, the Commodore 64, the TV – monitor (and the printer if connected) are all switched off. Plug the mains connection lead into the back of the 1541 and then connect the other end of the lead to the mains. Switch on the mains power to the 64, TV – monitor (and printer if connected). Do not at this stage switch on the equipment itself.

13) Turn the 1541 around so that its front is facing you, being careful not to snag any of the leads under the drive.

14) On the front of the 1541 you will see a small bar protruding. The bar will be in one of two positions: a) slightly below the slot which goes across the front of the drive or b) slightly above it.

15) If the bar is in position a), press it in gently with your finger and allow it to move gently upwards on its spring.

16) The disk drive door is now open. To make absolutely sure that the drive does not contain a disk or the square of cardboard used to protect the internal mechanism during carriage, close the door by pressing gently down until it locks and then opening it again.

17) If a disk or the protective card is now visible, remove by sliding gently towards you.

18) Switch the disk drive on (and the printer if connected). Both the green and red lights on the front of the drive will come on, the drive will whirr for a second or so, then the whirring will stop and the red light will go out. If the red light does not go out, switch the drive off, check the connections and repeat this step. If the red light still remains on, consult your dealer.

19) Switch on your 64. (You should see the same sequence as described under step 18)

20) Switch on your TV – monitor and tune it to the output of the 64.

21) You are now ready to use your Commodore 64 disk system.

Sequence

The recommended sequence for switching on a disk system once it has been properly set up is: PRINTER—DISK DRIVE—COMPUTER.

Given in figure 3 is the layout of a typical 5¼ inch floppy disk. Such disks will serve you well if you observe a few simple rules:

1) The disk is *never* removed from its protective envelope. It can revolve quite satisfactorily within the envelope and will be read through the READ – WRITE SLOT.

2) Floppy disks, or flexi-disks, are not designed to be deliberately flopped or flexed. If, by accident, a disk is momentarily bent slightly it should survive but there is no guarantee of this. There is always a slight amount of give in the disk when inserting it into the drive or removing it — do not worry about this, simply do not go to extremes.

3) Your disks will have been supplied with a protective sleeve which covers most of the disk envelope and protects the READ – WRITE SLOT. When not in use, disks should always be replaced in the sleeve. Disks should preferably be stored upright in a plastic (ie non-magnetic) box specially designed for the purpose. Never leave disks lying on any surface, out of their sleeves. It is common to see disks carelessly left lying about unprotected in the belief that, provided that the READ – WRITE SLOT on the 'front' of

Figure 5: the 1541 disk drive — fast and intelligent

the disk (the side with the labels) is not touched, all will be well Since the 1541 actually reads the disk from the back, this is unlikely to be true

4) Disks should never be exposed to a magnetic field, which includes leaving them on the top of the disk drive or the TV – monitor

5) Disks should never be exposed to dampness or extremes of temperature, which includes leaving them in direct sunlight

6) It should go without saying that you should never touch the READ – WRITE SLOT of the disk

8) Cheap disks, like cheap tapes, can lead to disaster Only you can decide how much your programs and data are worth to you

To place the disk in the drive, first ensure that the disk drive door is open, then orient the disk so that the manufacturer's label is upwards and the READ – WRITE SLOT end of the disk is towards the 1541 Push the disk gently into the horizontal slot on the front of the drive If the disk catches slightly as it is pushed home, do *not* attempt to force it — remove it and try again If you continue to have problems, check to ensure that another disk is not caught in the drive

Provided that no problems are encountered, the disk should be pushed fully home until no part of it protrudes and it remains in the drive without pressure from the fingers Finally, close the disk drive door — the disk drive cannot be accessed by the 64 until this has been done

Disks are removed from the drive simply by opening the disk drive door, when the disk will slide out approximately an inch If the disk does not appear, close and open the door again Disks which are reluctant to come out of the drive can just be reached with the fingers, though no force should be used

If disks continually stick in the drive, either there is a problem with the disks (such as a label sticking out over the edge) or the drive is faulty Never poke inside the drive with any kind of tool to try to free a disk — especially if the drive is connected to the mains

Complex

Never open the door of the disk drive while the red light is on and the drive motor is running, or damage to the disk may result Note that some editions of the 1541 manual incorrectly state that the disk may not be removed while the *green* light is on The green light is the disk power indicator and the only way to extinguish it is to switch off the power to the drive On no account do this before removing the disk

Like any other complex piece of equipment, it is possible for the 1541 to lapse momentarily from its usual high standard of reliability It is possible for instance, for errors to be encountered in the reading or writing of a program, or for some other problem to arise which prevents a disk command being properly carried out In this case the red drive light will flash on and off and you should repeat the procedure which led to the error if you are sure that the mistake is not your own

In some circumstances, it is possible for a situation to develop where the 64 and the disk drive simply refuse to communicate with one another Following the recommended switching-on procedure, the solution would be to remove the disk, to switch off the 64 and the disk drive and then to switch them on again in the correct order

If the 64 contains a program which you are trying to save then our experience is that removing the disk and switching off the 1541 (and any other device connected to the serial bus, such as a printer), and then switching it back on again will almost invariably solve the problem It is as well to remember that, if all else fails, the Datassette recorder may well be capable of redeeming the situation by saving the program until the disk system can be sorted out

It is unlikely that the 1541 will give you many problems if you remember that it is a precision engineered machine which, unlike the 64, has moving parts which should not be subject to vibration, sudden shocks or excessive heat (including direct sunlight)

Though it seems a small point to be given a separate section, *do* always check that the disk drive door is open and the drive empty before switching off the drive In actual fact, disks are seldom damaged by being left in the drive when it is turned off, but it *can* happen ■

The *Commodore 64 Disk Companion* by David Lawrence and Mark England is published by Sunshine Books at £7 95

Depeché modem

*With modems getting cheaper all the time, there is a growing interest in all types of network and database. **Robin Wilkinson** reports on Micronet 800 and Compunet*

HOOKING up to the public telephone network is the next big growth area in the use of small micros in the home or at work. During the next few months two large online database operators, not to mention various bulletin boards and other service operators, will be courting the Commodore 64 owner.

Micronet 800, one of the largest databases on the UK Prestel viewdata network is opening up a special Commodore section in August, while Commodore has linked up with a giant American corporation to launch Compunet in September.

The major advantage of hooking up to the telephone system is the ability to access data which is held on other, very large, computer systems, eg Prestel. Transferring files from your computer to a friend's micro over a hundred miles away — or just on the other side of town — obviously has great potential, both for fun and experimentation.

Alternatively, you can access the bulletin boards — mini-databases often operated by enthusiastic amateurs — which have spread like wildfire in the United States.

Basic components

You need two basic components to connect your machine to the telephone network, apart from a micro and a telephone. Firstly you need a Modem — this controls the speed of data transmission from your micro to the host machine and vice versa. Secondly you need a terminal software package — this interprets what is coming down the phone line to your micro and converts it into a form your micro can understand.

In much the same way that disk drives and printers need interfaces to link them with micros, so communication devices need an interfacing mechanism. For modems, this consists of a serial interface, usually via an RS232 port. However, the Commodore 64 will have a cartridge containing software in ROM.

The data in your micro is transmitted between different circuits simultaneously and in parallel. But the micro generates digital signals, whereas the telephone network transmits the human voice in analogue form.

This is where the modem — it stands for modulator and demodulator — steps in, by converting analogue signals to digital and vice versa.

The signals generated by your computer are digital and represent 1s and 0s by separate voltage levels. A group of these bits (binary digits) is called a byte and the object of serial data is to send a byte or bytes from point to point along a single channel — in this case the telephone wire.

When no data is being transmitted, the voltage is kept between −3 and −25. Depression of a key on your micro causes the voltage level to be changed to between +3 and +25.

The full ASCII set in your micro is represented by 8 bit data. Additional bits are added to tell the host machine that the transmission of a byte is about to begin (the start bit) or end (the stop bit).

The letter A, for example, which is represented by an eight bit sequence will have at least 10 bits in a byte when transmitted over the telephone network. In fact it has more bits per byte so that the host machine knows what it has received. This is called the parity bit.

This method of data transmission is called asynchronous and allows the receiver to synchronise with the transmitter at the start of each byte. At the end of 10 or 11 bits of transmission, the receiver re-sets itself and waits for the next burst of data.

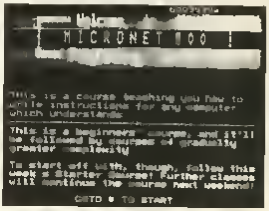
Another piece of crucial terminology used in modem communications is Duplex, which describes how data transmission takes place between two points.

Full Duplex. Two modems operating in this mode are each capable of receiving and transmitting data simultaneously. This is achieved by sending characters of differing tones in opposing directions.

Half-Duplex. Allows data to be sent in one direction only at one time, because both modems send characters in the same tone.

The final major factor to consider with modems is the speed at which they transmit data — known as the baud rate. This measures the number of modulations per second where the modulation signals a change in the transmission activity. Prestel and Compunet, for example, transmit data at 1200 bits per second, while your micro talks back to them at 75 bits per second. Hence a 1200/75 modem.

Most bulletin boards operate at 300/300, although some are now beginning to offer 1200/75. Micro to micro transmission of long files is usually best done at 1200/1200 for speed and economy or 300/300, though it can be done with 1200/75 as long as the modem has switchable receive and transmit options on it.



Finally, you need to decide whether to go for an acoustic modem (ideal if you want portability) or a hard wired modem. Generally, acoustic modems can be prone to line noise errors as the telephone handset fits into a moulded case, and there are a wide variety of telephone handset shapes and sizes. Some acoustic modems are extremely efficient having flexible "ear" cups, but tend to be a little pricey.

Hard-wired modems are becoming more widespread. They plug into a standard telephone wall socket (the type 600 BT now puts in with all new phone systems) and are therefore less prone to line noise, which corrupts data.

Two years ago, a modem for a home computer would have cost anything from £250 up but, with the advent of large public databases, modems can cost anything from £50 upwards. The ideal modem would be hard-wired offering 300/300, 1200/75 and 1200/1200 with auto send and transmit plus other frills. They begin at around £130.

Software

Once you have decided on a modem, the next thing is to choose the software best suited to your needs. Usually, modem suppliers will recommend a package they

know will work well with your particular micro

There are some golden rules to watch out for when buying this "terminal emulation" software The first is that communications can be fun, but watch out for that phone bill You should examine what facilities the software has to help keep your costs down

The second rule is ease of use — some software packages come in ROM with screen driven menus, but require a good knowledge of communications

Simple terminal software will allow you to log-on to most bulletin board services, view screens of information and type in messages whilst on-line Some bulletin boards will even let you have free software to help in the loggon process and download software as ASCII or hex files

Public databases

Public service databases offer more complex software that can allow you to edit and prepare messages off line for auto-transmission once on-line, thus saving telephone time Other features include auto logon and system identity storage and easy frame save and frame tag (to view pages of information such as daily news or share prices)

Once you are hooked on communications, the next thing to explore is the massive on-line public databases you can log into

Commodore owners have an extremely wide choice with two services aimed directly at them — Micronet and Compunet These are in addition to generally available services like bulletin boards and private information retrieval databases aimed at researchers or businessmen

Both services use videotex and both offer different modems and terminal software

Micronet 800 offers what it describes as a "state of the art communications cartridge" with plenty of frills, which can be used with any standard V21 or V23 modem The software comes in PROM and other terminal software for other systems can be overlaid onto it from disk or cassette Price is reckoned to be around £49 95

Special encoding included in the PROM to allow easy, but safe — from a software supplier's point of view — software downloading

Micronet will sell you a modem with 1200/75, 1200/1200 for around £75 00, although the whole package should be available in selected retail stores

Cost of Micronet in its basic form is £52 a year subscription which also lets you into many other Prestel services like teleshopping, national and international news, travel and home banking But, you will incur other costs on Micronet although messaging — at least at the moment — is free and nationally available from September on a local telephone call.

Prestel does charge you access time-based costs during peak telephone time of 5p per minute, but evenings and weekends are free

Full details from Micronet 800, Durrant House, Herbal Hill, London EC1

Compunet is in its formative stages and is not due for launch until late September, so direct comparisons are difficult at the time of writing

There is a big added bonus with Compunet — the first year subscription (which would normally be £30pa) is included in the price of the modem and special software for Compunet At £90 you get a 1200/75 1200/1200 modem, plus software, plus one year's use of Compunet However, once hooked up to Compunet you begin to run into other charges, though their level only really depends on when and what facilities you use

Compunet offers messaging like Micronet, but at 10p a time Other facilities include downloading of free and commercial software, local call access in major UK centres, off peak time free access, peak time (ie office hours) 10 8p

What is really attractive about Compunet is the ability for users to upload their own information or programs onto the network as the data is error corrected both ways You can charge for your own software in an area called the Jungle and Compunet takes a 40% commission The same applies for information you may sell

Software Park

Protected software is also sold in the Software Park, which is where the modem comes into its own It has a piracy prevention technique which prevents software once downloaded from Compunet being run on another micro

A commission of 50% is charged in the Park Users are charged for storing information pages or 1k bytes of programs at 13p a day per unit

Compunet expects to have a large teleshopping service operated by Compucard — you can buy goods at discount prices and have a direct debit account — banking and publishing Full details from Commodore Information Centre, 675 Ajax Avenue, Slough, Berks SL1 4BG, or ask a dealer for details

There are numerous bulletin board services scattered around the country which have evolved from the dominant days of Tandy Those are normally listed on public services and Distel which operates at 300/300 or 1200/75 Run by Display Electronics, it offers telesoftware, messaging and credit card shopping of components Write to 28-32 Biggin Way, Upper Norwood, London SE19 ■

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Vicsoft ready to head North

Will the Corby move mean better service from Vicsoft? Aye, there's the rub! Janet Ritherdon talks to Chris Jenkins

VICSOFT has been getting some pretty bad press recently — time and again letters appear in the pages of computer magazines which run along predictable lines "I sent my order to Vicsoft and six weeks later they sent me half of it I kept trying to phone them, but I couldn't get an answer I'm still waiting for my free gifts, it's been three months now " — and so on

Janet Ritherdon is now in the Vicsoft hot seat While acknowledging the service's past problems, she's quick to defend its record "It makes my blood boil sometimes when I see letters in the computer press attacking Vicsoft's service — firstly we aren't in a position to reply to individual criticisms, and secondly you never see letters being published which praise people Bearing in mind the size of the service, we only have a tiny proportion of orders which have problems "

Part of the problem has been the unexpected response to the service Vicsoft catalogues are now sent out with each new Commodore computer, but sales were so great last Christmas that software stocks were inadequate "We just underestimated the response we'd get — it's a mistake we're not planning to make next Christmas!"

Janet's full title is Customer Support Manager, and her responsibilities include Vicsoft and the Information Service "I started with Commodore as personal secretary to Howard Stanworth, the UK general manager I didn't have any real knowledge about computing, but the area didn't intimidate me — previously I'd been working in the hotel business, so I'd had some experience using VDU's, I'd also had a lot of experience dealing with the public, which was useful, since a large part of a personal secretary's job is involved with keeping the public away from the boss!"

User error

Janet's position as the general manager's secretary gave her a unique insight into the operation of all sections of Commodore UK, and an understanding of the company's customer relations policy "I got on very well with Howard Stanworth — I think you could say his attitude to the public is 'firm, fair and friendly' He's aware that we must deal sympathetically with users problems, but the company has no intention of being soft — Commodore isn't the kind of company to dole anything out Around 50% of the problems we deal with are due to user error, so it's wrong to assume that the company is usually at fault "

The technical enquiries section has two experienced computer users available to answer questions, with a complete range of hardware and software available to check queries "It's difficult to answer some telephone enquiries, since if someone claims that they're typing in a program correctly you can't check it over the phone The only way to deal with user error is to be very patient! Our technicians are kept busy all day answering enquiries, but once we move to Corby we should be getting another three people

"Some of the questions we get about third-party software, which is sold through the Vicsoft catalogue, are more difficult to answer, and in those cases we sometimes have to refer people to the relevant software house If you have a technical query you must phone the information centre number, which is given on all our advertisements — there's no point phoning Vicsoft, since it's purely a mail-order service, which doesn't have any technical people "

Errata

Some problems arise because of mistakes in the 64's manual or the Programmer's reference guide — "There's a six page correction sheet for the manual, and a short errata sheet for the PRG — these are now being included with new machines, but if anyone needs a copy they should just contact the information centre Also please let us know if you're sure you've spotted any other errors "

In-house training of technical staff should mean that the information centre service becomes even better Most criticisms, though, are levelled against the Vicsoft mail order service — so what have the problems been there?

"We send out a catalogue each quarter for the 64, and one for the Vic We try to stagger the release dates so that the peak orders, which come about a month after the release of the catalogues, fall on different dates, but in the past we've been caught out by underestimating the response we'd get One of the most common complaints against Vicsoft was that the free gifts offered on joining the club were very slow in coming This is because we ordered a certain quantity of dust covers and disk boxes, and those went much faster than we anticipated We went back to the manufacturers to get more supplies, and they just couldn't do it It was partly

Janet Ritherdon and Vicsoft's overcrowded Slough

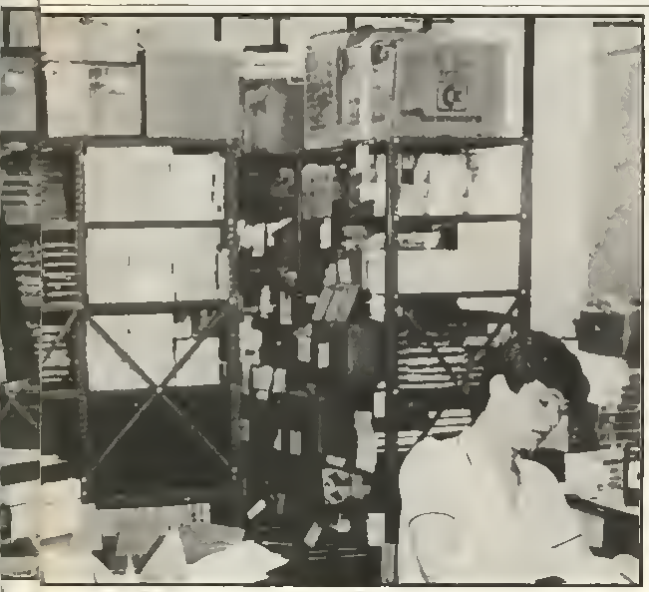
Vicsoft's fault for underestimating the tremendous number of sales notched up by the 64 last Christmas

"Another problem is that since orders peak about a month after the catalogue is released, we can receive anything between 150 and 1000 software orders for each computer each day This makes it very difficult to control our staffing levels, though staggering the catalogues does help "

In an attempt to control stock more efficiently, Vicsoft has appointed a stock controller "All operations so far as possible are now computerised Slough's mainframe is a Honeywell, and the Corby one, which is already running, is an IBM38 Incoming orders are entered onto Vicsoft's VDU's Cash checking is done by hand, and invoices are sent to the Vicsoft warehouse, where the orders are packed and despatched All out-of stock items are recorded on the stock controller's CBM700, and now, instead of waiting for fresh stocks to come in, we put in special orders Disks and tapes we can usually deal with fairly quickly

Cartridges

"Since cartridges are manufactured in the Far East, they create more problems By surface, delivery takes six to eight weeks, but in emergencies we can arrange for air freight, which is expensive but only takes three days The last emergency air delivery was of the International Soccer cartridge It's been outselling everything else for months, and I expect it will



warehouse — Corby move will mean better service

continue to do so at least until Christmas At the moment we've only got seven copies in stock — perhaps it's time for another emergency order!"

Occasionally problems arise when programs are advertised, then have to be debugged before full production Fortunately, Commodore is rarely guilty of this, though supply problems for programs in production are not unheard of "When we move to Corby, the space allotted to Vicsoft will be much larger than the space we have here in Slough Unfortunately we're the last to leave, since the section of the new factory which is to house Vicsoft is the last to be completed Commodore has outgrown the space available at Slough, and Vicsoft is expanding as fast as any part of the company We aim to provide a better service after the move, and don't anticipate much problem in the move itself "

Northerner

Janet Rutherdon is a Northerner, and as such is only too pleased to be moving closer to home "I think the move is good for the company, and it's good for me too Everyone at Slough was offered jobs in Corby and about 50% of the Vicsoft-information centre staff are moving I believe almost all the software section have chosen to go There will unfortunately be redundancies among those who chose not to go to Coby The move should be completed by the end of August "

What of the future of the Vicsoft service itself? What will Commodore owners be getting for their £5 annual subscription fee? "We'll be continuing the special discount offer and the free gifts on joining, although it's largely a marketing decision what to offer There'll probably continue to be a promotion based around disk drives, though the free Easyscript offer has now ended Again, the decision on that is really the province of the marketing department rather than Vicsoft itself "

Mailing list

Janet was quick to point out that anyone can buy from Vicsoft without having to join the club "We do have many thousands of members, though — unfortunately, at the moment I can't give an exact figure The situation is complicated because we also have a mailing list, of around 100,000, which is made up from the registration cards we receive from each machine sold This list is probably very much out of date, and we're revising it so that we can avoid sending out material to people who perhaps bought their Vics several years ago and have now moved on to other machines "

Vicsoft is run semi-independently from Commodore, and is expected to make a profit "In effect we buy stock from Commodore — although no money actually changes hands — and we buy from outside supplers We then operate the mail-order service and hope to make a profit, which at the moment we do It's not a huge profit, but obviously if it dropped too far I'd be in hot water! The information service, though, is purely that — a service for customers "

Future plans will obviously include software for the Plus/4 and C16 "We're not planning to push Vicsoft as a hardware supply service, since this involves servicing problems — any equipment sold would have to be posted back to us in the event of a problem, and people are understandably reluctant to do that "

Product

A catalogue devoted to software for the new machines must obviously wait until sufficient product is ready to make it worthwhile "I know that there are several programs ready, or nearly ready, in the software department, and we have to wait for third party software to come through too Obviously we'd like a big Christmas launch, but it's really too early to say A lot depends on the response from outside software houses "

On the future of the Vic 20, Janet was optimistic "The next Vic 20 catalogue has just gone to the printers, and it's the biggest ever I don't see any sign of the demand for software falling off Even if the machine is discontinued, there's such a large user base out there that software should continue to sell At the moment 64 software is just outselling Vic, but as I've said the situation fluctuates It's mostly games for the Vic, many with educational aspects, while for the 64 it's a good mixture of games, education and utilities There's some sign of a move towards disk, but I think prices and a lack of information about disk drives are still putting many users off "

Catalogue

The other change planned is in the nature of the Vicsoft catalogue itself "We have a new editor, Jane Lunn, who used to work on the mail order section She knows the service, and as Commodore likes to encourage people to go into higher posts if they show talent the was the obvious choice " Jane's plans include giving the catalogue more of a "club" feel, encouraging a feeling of membership as well as emphasising the financial benefits of joining Vicsoft

"We're thinking of doing things like giving away badges, running competitions, having more programming hints, and so on," comments Jane "We want to make the catalogues fun rather than just a list of software — something you can sit down and read through, perhaps pass around in school Remember that in the case of the Vic especially many of the readers are very young, and we want to give them more to enjoy "

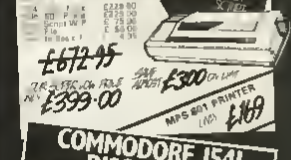
Future

There's really no telling what Vicsoft will do next if growth continues at the present rate Already Janet Rutherdon has taken on 18 people for the Corby plant, and when the move is complete Vicsoft can continue to expand in all directions

Travelling back to Slough station even the taxi driver wanted to know what was going on — "Have you seen that International Soccer game," he asked — "is it as good as it's made out to be?" Another customer for Vicsoft! ■

Computerama 64 the source

64 EXECUTIVE OUTFIT



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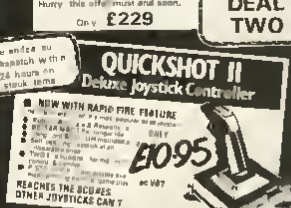

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HARDWARE REVIEW

The joy-stick jury

Mega-zapping David Fox judges the games controllers

NO DEDICATED GAMES PLAYER can afford to be without a joystick. In some cases you'll find that there are no key control options given with a game, and sometimes they won't do you much good even if they are provided — the games are so complicated that you'd have to have an octopus for a mother in order to be able to play them.

Vic 20 and CBM 64 owners are luckier than most computer users, in that there are joystick ports provided on the machines —

Quickshot 1 — industry standard

no need to worry about interfaces! Since the standard Atari-type D socket has been adopted by Commodore, there's an enormous choice available when you're shopping for joysticks. So here's a guide which will help you to choose the stick that's right for you — and show you how to reach the scores you've always dreamed of!

All joysticks are the same, right? Wrong! When you're choosing the one that's right for you, you'll have to take into account the size of the handle, the type of grip, the

Quickshot 2 — rapid fire

trigger type, any special gimmicks, and more.

Lets first look at an industry standard, the stick you'll find in every shop. The **Spectravideo Quickshot One** is manufactured in America and distributed here by **Vulcan Electronics**. It's a straightforward stick with a contoured grip and fire buttons both on top of the handle and on the square base. Like all the other sticks reviewed here, I tried it out on Alligata's Guardian for the 64, an immaculate implementation of the arcade classic Defender which requires the utmost skill in joystick control and quick firing.

The Quickshot One responds well to handling, and the fire buttons are smooth

Arcade — microswitch control

A great advantage is that the Quickshot One has four suckers which enable it to be attached to a flat surface. This makes it much easier to operate the additional keyboard controls which are required in many of the more complex arcade games. In Guardian, for instance, you need to operate Hyperspace and Smart Bomb controls as you fly your spaceship and operate the fire button for your lasers. Being able to anchor the stick securely means that it's much easier to operate it one-handed, and leave the other hand free. The base mounted fire button makes left-handed operation easy. Quickshot One costs around £9.95.

Good points; Smooth response, suckers on base, fairly cheap.

Bad points; Probably couldn't take rough handling.

Another from Spectravideo, distributed by Vulcan, is the unimaginatively named **Quickshot Two.** Again, this one has suckers on the base and a square body, with a contoured grip. It differs from the Quickshot One in two major respects. Firstly, it has a front mounted trigger fire button as well as a top-mounted thumb fire button, and secondly, it has a rapid fire option switch built into the base.

I like the trigger style fire button very much — I find it much easier to operate than a thumb button. Ten out of ten to Spectravideo for putting the fire button where it should have been in the first place. The rapid fire option is perhaps not for purists, since it gives you an unfair advantage. Simply switch to rapid fire and

Pro-Ace — precision

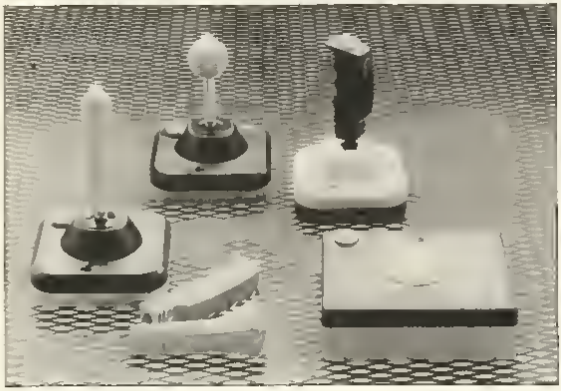
hold down the trigger, and the stick will fire as fast as your computer can manage. Rather than being able to squeeze off about four shots per second on Guardian with the normal option, Rapid Fire manages around 12! It may sound like cheating, but there's nothing quite like it if you want to survive wave after wave of attacking mutants and reach 100,000 points. Quickshot 2 costs £11.95.

Good points; Trigger-style fire button, suckers on base, rapid fire option.

Voltmace Delta 3SC — pleasant

Bad points, Handle perhaps a little over sized for some players.

Another nice simple joystick is the **Arcade,** made in Holland and distributed here by Dynarms. It has a strange wedge-shaped body which fits nicely in the hand, a single base mounted fire button which is suitable for left- or right-handed ▶



The Wico range — 3 Way Red Ball Boss and Trackball

◀players, and a shaft topped with a moulded ball The Arcade has a microswitch contact system which makes it very accurate indeed, and causes it to make a pleasant clicking sound in operation The fire button is large and operates smoothly The Arcade costs £15 00

Good points, Easy to hold, excellent microswitch system, available in Commodore 64 colours

Bad points; no suckers, though it does have non slip rubber feet

The **Pro-Ace Competition Joystick** from Sumlock has a pyramid-shaped body surmounted by a long, thin handle The fire button is on the top, and there's a base mounted fire button too Although the control afforded by the stick is very precise, there's very little movement in the handle I never really got the feeling that I was flinging my space fighter around the sky The Pro-Ace costs £11 95

Good points, Precise control, extremely durable

Bad points, Little movement in handle, no suckers but rubber feet

The **Voltmace Delta 3SC** joystick makes a pleasant change it has a flat rectangular base with three small fire buttons arranged in a triangle and the handle is small and delicate Again, not one for those of you who really like to get into the act of playing at space pilots, but with a little practice you can achieve very precise control The Voltmace was originally designed for the Dragon computer, and is made in England — so if you want to be patriotic, at £10 this is the one to go for!

Good points, Very precise control with spring-centred stick

Bad points, No suction cups or rubber feet

On now to the impressive range from Wico, who have gained more experience than any other games control manufacturer through their work on actual arcade games The Wico controllers are notable for their excellent construction and extremely high reliability Distributed by Computer Games Limited, the Wico range leads off with the **Boss** Costing around £13, The Boss has a very comfortable contoured grip with a fast-reacting top thumb-button The shaft is precision-engineered steel, so you can really bash this one about — it should take anything you can deal it The switch system works on a leaf principle so in theory it's fast and reliable

Good points, Well-engineered, nice grip

Bad points, No suckers but rubber feet

In the Wico Command Control series, the standard joystick is the **Famous Red Ball** At £23, you'd have to be a dedicated games player to fork out for this one but you'd be getting the best as far as engineering and precision are concerned It's similar in construction to **The Boss**, but has a steel shaft with a large ball grip, on top of which is mounted the fire button There's another button on the base and a sliding switch which selects between the two — not a good idea in my view, since if your thumb gets tired you should be able to use the base trigger for a change

The Famous Red Ball has a large base which I found uncomfortable to grip, but I suppose I could get used to it

Good points, State-of-the-art engineering for great accuracy

Bad points, Cost, poor non slip feet

On to the **Three-Way Deluxe** joystick, which is basically a Red Ball with interchangeable handles There's a contoured grip, a smooth baseball-bat shape and a thicker-shafted grip with a gear-stick like head At around £25 this stick could be recommended only to wealthy but indecisive computer gamers Though it has the same high standards of construction as the Red Ball, it seems more sensible to try to find a stick the shape of which suits you perfectly — after all, that shape of your hand doesn't change between games

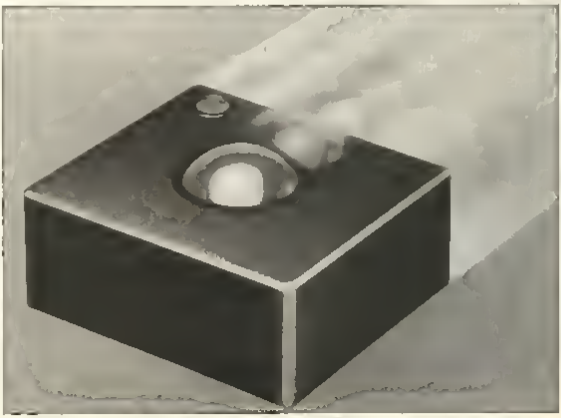
Good points, Well engineered, choice of handles

Bad points, Cost, tendency for handles to slip off shaft if you yank them too enthusiastically!

The last Wico device isn't a joystick at all, but a **Trackball** At around £45, the Trackball consists of a phenolic sphere mounted in a heavy rectangular base You control the movement of your spaceship (or cursor, or whatever) by rolling the ball This allows you to control the speed as well as the direction of movement The big disadvantage is that in order to keep something moving, you must keep rolling the ball — you can't just jam it over hard to left and keep flying The result is that the Trackball is pretty useless in a game such as Guardian, but would be perfect for games like Missile Command, the arcade game in which it first appeared It's a pity there aren't any versions of Missile Command for the 64!

Good points, Interesting design method gives full velocity control

Bad points, Cost — ouch! Limited applications



Datel Mesterplus — attractive price doubles as a mouse

Datel Electronics also offer a trackball, the **Mosterplay** Features are almost identical to the Wico, but the price is a much more attractive £19 99 The unit uses magnetic sensors, and, as Datel points out, therefore acts as an almost true analogue input — making it ideal for applications beyond games play, such as "mouse" functions

Good points, Inexpensive trackball

Bad points, Again, not suitable for all joystick games

Back to more conventional joysticks with an excellent design, the **Super Champ** from Dean Electronics This enormous macho joystick features a textured grip, suckers on the base, and both trigger style and top-handle fire buttons At £12 95 this one is a really good buy — I enjoyed using it despite the fact that it looks like some dubious marital aid When you've finished playing, just twist the handle and the extra long cable is wound into the large circular base — no more tangled wires!

Good points, Suckers on base, trigger style fire button, cable storage feature, extremely macho Top seller in the US for the last two years

Bad points, Handle probably too big for some players, not something you'd want to leave lying around for Auntie to see

Our last collection comes from the American Suncom range, distributed here by Consumer Electronics Ltd The emphasis of the range seems to be on small, well-engineered sticks which concentrate on performance rather than flash The **Starfighter** has a small square black base with a short shaft with a rounded end The fire button is on the left of the base top Remarkably easy to hold because of its rounded edges and light weight, the Starfighter is fast and accurate, and costs around £13 95

Good points, easy to hold, good response, very light and small

Bad points, No good for left handers!

Suncom's **TAC-2** (Totally Accurate Controller) solves the problem for left-handers — featuring a base only slightly larger and heavier than the Starfighter, with the same excellent response, it has in addition a steel shaft with a ball-end, and an extra fire button on the base Cost is around £18 95

Good points, Light, easy to hold, good response, suitable for left- or right-handers

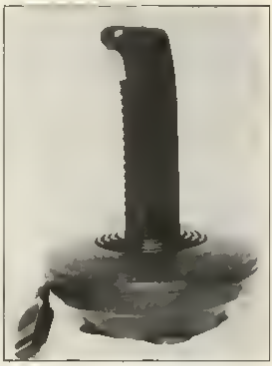
Bad points, A little expensive, rather inadequate non-slip feet

Half way between the two is the **Slik Stik**, which combines the Starfighter's base and single fire button with the TAC-2's shaft and ball grip At £9 95, the Slik Stik combines the good and bad features of the two others, namely,

Good points, Light and accurate, well-engineered

Bad points, No good for left-handers, again — they seem to be missing out!

The last in out mammoth round up of joysticks is, like the Trackball, not a joystick at all — it's a Joystick Simulator What, I hear you say, how can you simulate a joystick? Well, the Suncom **Joy Sensor** is an electronic touch sensitive controller The lightest of touches on the circular touch pad set on the rectangular base is enough to create a response A sliding switch controls whether movement is four direction or eight-direction, which is handy for selecting between, say, space games such as Guardian or Pacman-style maze games where your choice of direction is limited



Super Champ — a winner

The Joy Sensor also has touch-sensitive fire controls, ordinary ones on right and left and rapid fire in the middle I've already commented on the advantages of rapid fire, so those of you with no moral scruples about mowing down the enemy in hordes will understand the attraction of the Joy Sensor It's very difficult to learn the discipline of moving your thumb around on the pad, but once mastered this controller is great to use Moves are much faster because there's no mechanical resistance to overcome, and the Joy Sensor should be almost impervious to wear! Start saving your £29 95 now

Finally, although I'd choose the Super Champ or Quickshot Two if I were forced to pick a winner, it's worth saying that you can only pick the stick that's right for you by trying out as many as you can Just don't mention my name to the shop assistants!

Suncom range — Starfighter SlikStik Tac 2 Joy Sensor

Contacts,

Vulcan Electronics Ltd, 200 Brent Street, London, 01 203-6366

Dynamics Marketing Ltd, Unit 15, Colling Close, Irlam, Manchester, 061 775-1827

Sumlock, 198 Deansgate, Manchester, 061 834-4233

Voltmace, Park Drive Baldock, Herts, 0462-894410

Computer Games Ltd, GGL House, Goldings Hill, Loughton, Essex, 01-508 5600

Datel Electronics, Unit 8, Fenton Ind Est , Dewsbury Road, Fenton, Stoke-on Trent, 0782 273815

Dean Electronics, Glendale Park, Fernbank Road, Ascot, Berks, 0344-825661

Consumer Electronics Ltd, Farnsworth Manchester, M35 0HS, 061 682-2339 ■

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(Sierra-On Line) — disk

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(Micro Simplex) — disk

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(Microsoft) — disk

Easy to use but very powerful spreadsheet You can define cells by word labels rather than co ordinates Sorts columns or rows numerically or alphabetically UK version £86 00 dealer sign US version at very special price of £65 00 Very highly recommended Serial printer output

CALCRESULT
£95
(Handic) — disk

(see true 3D (multipaging) facility bna histogram features Versions for Commodore and Epson printers This is a very powerful and much liked spreadsheet Very highly recommended Single page version £47 50 (cartridge)

MICRO ASSEMBLER
£55
(Supersoft) — cartridge

Best of the lot If you re into machine code — or whoing that way — this is the one to get or save your pennies for Features 3 pass assembler unlimited labels source files can be linked. monitor full screen editor disk or tape operation Plus AUTO DELETE FORMAT FIND NUMBER DISASSEMBLE OUT and TABLE Monitor has standard TIM commands plus hunt transfer and disassemble

KOALAPAD
£75
(Koala Tech Corp) — inc cartridge

Touch tablets you can use not only for creating spectacular graphics but also for musical LOGO and educational uses Comes complete with KoalaPaint cartridge which permits all these fantastic graphics facilities — commands include zoom copy colour swap draw lines rays Save pictures on disk and call these up from BASIC to use in your own programs! Program more Guide (disk £10 75) is useful Logo Design Master (disk £28 00) Spelling I (disk £28 00) Colouring Series I — Geometric Designs (£21 00) are some of the other support programs available but it s easy enough to write your own

HOME ACCOUNTANT
£53
(Continental) — disk

There are many home accounting programs some cheap and cheerful, others — like this — are something else This is the best home accounts program for the 64 — BUT IT IS CLEARLY SUITABLE FOR SMALL BUSINESS USE AS WELL Features include 100 budget categories monitor up to five chequebooks bank reconciliation and report on year s budget/actuals balance sheet net worth income and expenses summary balance sheet all activities in given budget and special field reports (such as all cheques written within a specific category or to a specific party Creates three kinds of graph — bna much more This may cost four times what a cheap bank statement program but you can measure its worth in multiples of ten! Very highly recommended

THE LAST ONE
£97.50
(BJ A1 Systems) — disk

Programming aid that frees you from the graft if you re thinking of writing specific applications Creates stand alone error free basing in standard BASIC Input is in the form of one line descriptions defining in plain English the user s intention This write flowchart act as basis of computer s questioning session which bases Programs you create can be for any application Highly recommended

CODEWRITER
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Database design system like TLG Easier to work with but marginally less powerful Disk 1 features data entry generator disk 2 series report and menu generator Very flexible Highly recommended

SUPERBASE 64
£88.00
(Precision) — disk

Really excellent database generator still at our special price All things considered we think this one s the best of its type and a must for all serious Commodore 64 users Can be used for anything from trading lists to stock control and invoicing Lets you tailor the database to your exact requirements Differs from program generators such as TLG and CheqWriter in that the systems menus and core program are always the same But Superbase is not less the powerful for that — in fact it has database features and facilities beyond the needs of mere mortal folk! Now with STEPPING STONES program modules at £10

FLIGHT SIMULATOR II
£35
(Subiogic) — disk

This is so good the authors think you can learn the ropes so far as instrument control bna flying are concerned Accepting the limit stone on the graphics side — nevertheless outstanding in terms of personal computers — the simulation is quite excellent Expensive but it s the best one for the 64 by far We do have flying simulators SOLO FLIGHT HELLCAT ACE IFR (all on disk £25)

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(Infocom) — disk

This series of text adventures are the best that are available NOTE OUR NEW LOW PRICE! Excellent selection of other adventures also available (see our list) including the splendid Level 9 series

S.A.M.
£42
(Trunix) — disk

This is SOFTWARE AUTOMATIC MOUTH a quite outstanding piece of software which gives your 64 limitless speech synthesis capability Offers English text to speech or phonetic input in direct or program modes Full control over pitch speed inflexion There really isn t anything like it even on hardware!

M.U.L.E
£30
(Electronic Arts) — disk

A game in which up to four players attempt to settle a distant planet with the so-called help of a multi-tied machine they all learn to boss Now here s one to take the piece of Monopoly — exactly what a board game should be like on a computer Very addictive

COLOSSUS CHESS
£9.95
(CDS) — cassette

This is the best of the chess programs available for the 64 Cursor controlled piece movement Turn by turn move listing and assessment Multi levels of play Game replay feature A must if only to learn to play chess!

Plus all the latest games — VALHALLA (£14.95), ALICE IN VIDEOLAND (disk £12 95)

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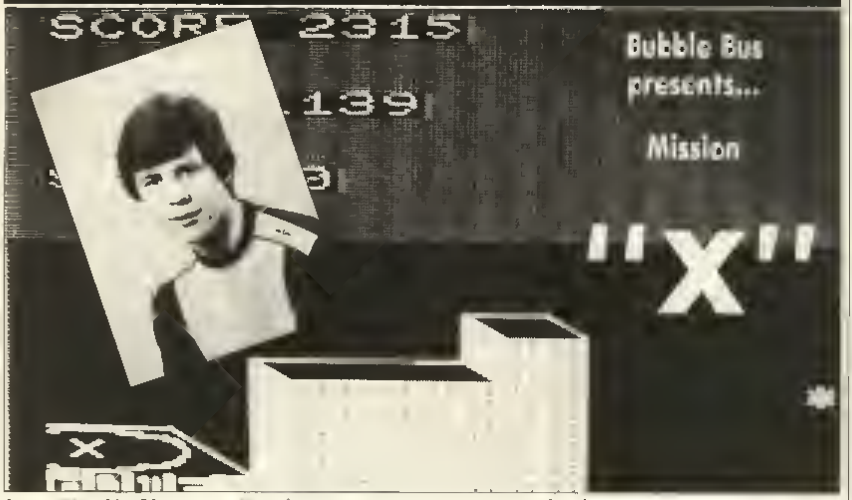


*An exciting Vic 20 game written by young star programmer **Richard Clark** of Bubble Bus Software*

BUBBLE BUS SOFTWARE lives in a converted granary close to the Medway in Tonbridge, and hot off its computers comes a Vic 20 game from star programmer Richard Clark

Richard walked into Bubble Bus' office at the age of 16 with a stack of programs Seeing his potential, Bubble Bus asked Richard to write a program, **Bumping Buggies**, which turned into one of the company's biggest successes

Richard started programming on the ZX81 and moved onto the Vic 20 two years ago He taught himself machine code programming, then graduated to the 64 Writing Bumping Buggies took him three months, working at weekends

Now that Richard's finished his science 'O' levels, Bubble Bus is taking him on full time as a 64 programmer

His next project is **Cavern Fighter**, in which the player takes on the role of an intrepid explorer battling different monsters in a complex of caves

As for Bubble Bus, the company, which started two years ago producing Vic utilities, is now concentrating more on games With the success of the pool simulation **Hustler** for the 64, and the popular **Kick Off**, both written by Nick Strange, Bubble Bus has established a reputation which continues to grow Forthcoming projects include **Strike Force**, a war simulation by Falklands veteran Terry Owen, and the utilities package **Quadrillion**, which includes Word Wizard, Poster Printer, Label Printer and Advertiser on one disk

Bubble Bus will continue to work on the 64, although MSX and Sinclair machines also figure in future plans

Mission X uses the full potential of the unexpanded Vic 20 It's a fast moving 3-D game featuring impressive use of sound and colour

It's a three stage game, in which the first part involves using your space fighter to knock flags off the top of enemy installations Once this has been done the only way is to refuel by passing through as many fuel gates as possible Finally you have to land your craft on the landing

Use F1 for upward thrust, and F3 to keep the ship level Use neither and the ship begins to fall Each flag scores 100 times the flag number Going through a fuel gate scores 250 and 50 fuel units Completing a level scores remaining fuel times the level number

There are eight levels of difficulty, with the height of the buildings becoming more varied and more stars appearing in the fuel gate section

The program is in two parts You should first type in program one, and save it as MISSION X Then type in program two and save it after the first part To load in the game just load and run the first program, and it will load in the main section

The first program sets up the defined graphics and a small machine code screen scrolling routine, and the second program is the actual game

190-220	Set up variables
250-280	Set up game display
300	Access scroll routine
310-320	Check for collisions
350	Display spaceship
400	Call scenery display routine
450-780	Update and display score
800-802	Check for keyboard inputs
805	Check for fuel gate
1000-1490	Display buildings and flags
1500-1550	Display fuel gates
2000-2440	Display landing pad
2450-2495	Check for crash
4000-4110	Completed level

Take your place in the cockpit, and good luck with Mission X! ■

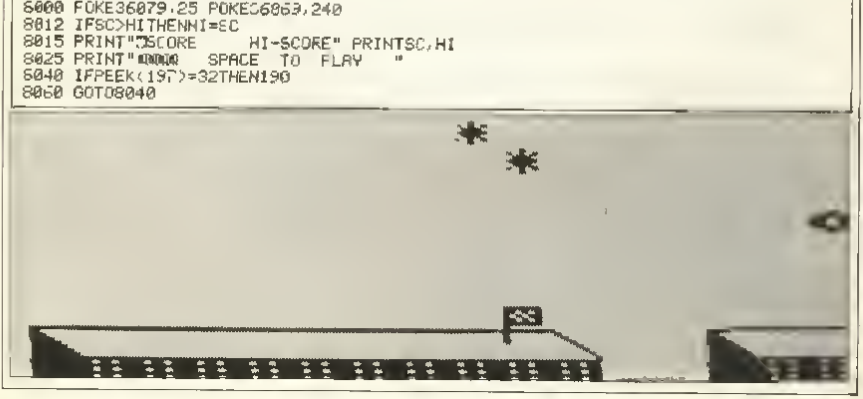
```
1 POKE46,26 POKE45,240 PRINTCHR$(2) CLR
2 POKE51,0 POKE52,28 POKE55,0 POKE56,28
5 GOSUB5000
10 FORL=673TO673+72 READX POKEL,X NEXT
20 DATA72,152,72,138,72,56,169,220,133,87,169,30,133,88,165,87,232,1-133
30 DATA89,165,88,208,0,133,90,162,12,160,20,136,177,89,145,87,136,208
40 DATA248,169,32,145,87,24,165,87,105,22,133,87,144,2,230,88,24,165,89,105,22
50 DATA133,89,144,2,230,90,202,208,217,104,170,104,168,104,96
95 FORR=7168TO7879 POKER,PEEK(R+25600) NEXT
```

```
90 R=0
100 READD IFD<>-1THENPOKE7168+R,D R=R+1 GOTO100
110 DATA255,219,255 219 255,219 255 255,255 192 224 240 248,252 254 255
120 DATA255 255,255,255,255 255 255 255 0 24 126 215 255,126,24 0
125 DATA0,24,126,207,243,126 24,0 0,24 126 231 231 126,24 0
130 DATA255 64,64 64,0 0,0 0,0,0,126,106 86,106 126 64
135 DATA255 0,0,0 0,0,0,255,255 127 63 31 15 7 3 255
140 DATA255.160,159,159,159 159 95,63,252,2 255 255 255 255,255,255
145 DATA255,192,160,144,136,132,130,129 255 0 0 0,3,6,4 3,255 0 7 124 128 0 0 0
150 DATA255,127 192 0 0 4 2 1,255 254,0 0 0 32 64,128,255 0 224 63 1,0 0 0
155 DATA128,64,32,16,200 100 24,17 128,128,128,126 128 126 126 128,156,72 36,22,
11 4,2,1
160 DATA0 0 0,0,128,124 7,0 1,2 4 0 0 0,192 127 126,64,32 0 0,0,0 254
165 DATA0,0,0,0 1,63,224,0,16,16 32,96 192 0 0.0.129,177 185 131,195,195 129 255
,128,64
170 DATA32 16,8,4,2,1,189,189,189,129.157,157,157,255,129 185,185 189 189 189 12
9,255
175 DATA129 181 181 149,149,149,149 255 128.191,191 129.159 159 129,255
180 DATA0 0 0.0 0 0 0 0 135 219 219 129,157,157,157 255
185 DATA0,0,0,0 0.0,0,0 129 191,191.129,249 253,129 255 -1
1020 LOAD
5000 PRINT"" POKE36879,26
5020 PRINT"    M I S S I O N  X"
5050 PRINT" DESIGNED BY  .CLARK."
5060 PRINT" CONTROLS"
5070 PRINT" F1 - UPWARD THRUST"
5080 PRINT" F1 - KEEPS SHIP LEVEL"
5155 PRINT" P L E A S E  W A I T'
5160 RETURN
```

MISSION X — PROGRAM 2

```
180 GOTO8000
190 L=1 SC=0 LI=3
200 O=1 M=0
210 POKE36869 255 POKE36879 4
220 A=0 SH=3 F=12 MM=0 V=23 FL=1500 FP=0
230 POKE36875,15
250 PRINT"BBBBBBBBBBBBBBBBBBBBEE" FORR=1TO9 PRINT"BBBBBBBBBBBBBBBBBBPBBBBB"  NE
XT
260 PRINT"SCORE" PRINT"FUEL' PRINT"SHIPS"LI-1
265 IFO<1THEN275
270 PRINT"A  \" PRINT"P@@@" PRINT"I@@@"
275 PRINT"" FORR=1TO11 PRINT"BP" NEXT PRINT"B"
280 PRINT"BBBEBBBBBPPPBBBIBBBBP", POKE8125 2 POKE36905,6
300 SYS6673
305 IFO=3THEN2450
310 IFPEEK(8051+A)=7THENSC=SC+(M*100) MM=MM+1
320 IFPEEK(8051+A)<>32ANDPEEK(8051+A)<>7THEN5000
350 POKE8051+A,SH
360 SH=SH+1 IFSH=6THENSH=3
400 ONOGOSUB1000 1500,2000 IFM=10ANDP=11THENO=2
414 IFM=20ANDV>22THENV=0
415 IFM=20ANDV=22THENO=5 F=INT(RND(1)*10)
450 PRINT"SC PRINT"FL'"
780 V=V+1 FL=FL-1 SC=SC+5 IFFL<=0THEN5000
800 IFPEEK(197)=39THENA=A-22 POKE36877 150 FL=FL-5 GOTO300
802 IFPEEK(197)=47THENPOKE36877,200 FL=FL-20 GOTO300
805 IFPEEK(8051+22+A)=11ORPEEK(8051+A-22)=11THENSC=SC+250 FL=FL+50
807 POKE36877,0 A=A+22 GOTO300
999 GOTO300
1000 F=F+1 IFP=13THENF=0 LL=INT(RND(1)*L*22)+22
1005 IFINT(RND(1)*(L+5))>5ANDF>1ANDF<10THENF=F+1
1010 IFP=1THENFORR=8142TO8142-LLSTEP-22 POKER 0 NEXT POKER 77+128
1020 IFP>1ANDP<11THENFORR=8142TO8142-LLSTEP-22 POKER,0 NEXT POKER,99+128
1022 IFP>1ANDP<11ANDINT(RND(1)*40)>30ANDM<10THENPOKER 6 POKER-22 7 M=M+1
1030 IFP=11THENFORR=8120TO8142-LLSTEP-22 POKER,0 NEXT POKER 1 POKE8142 9
1040 IFP>11ORP<1THENPOKE8142,8
1050 IFINT(RND(1)*25)>LTHENRETURN
1060 AS=INT(RND(1)*5)
```

```
1070 IFPEEK(7900+(A3*22))=32THENPOKE7900+(A3*22),42+128
1490 RETURN
1500 FORR=1TO50 NEXT
1505 IFINT(RND(1)*10)=0ANDFG<=0ANDM<20THENFG=INT(RND(1)*7)*22+22 M=M+1 GOTO1520
1510 IFINT(RND(1)*8)<LTHEN1515
1513 AE=INT(RND(1)*6)*22
1514 POKE7900+AS,42
1515 FG=FG-22 RETURN
1520 POKE7900+FG,10 POKE7901+FG 11 POKE7966+FG 10 POKE7967+FG,11
1550 RETURN
2000 PP=PF+1 POKE8142,99+126
2010 IFPP=1THENFORR=8142TO7988STEP-22 POKER,0 NEXT POKER,77+128
2030 IFPP=2THENFORR=8142TO7938STEP-22 POKER,0 NEXT POKER,99+128
2040 IFPP=3THENFORR=8142TO8062STEP-22 POKER,0 NEXT POKER,9 POKER-22,2 POKER-44,1
2045 IFPP>3ANDPP<11ORPP=13ANDINT RND(1)*3)=0THENPP=PP+1
2050 IFPP>3ANDPP<12THENFORR=8142TO8062STEP-22 POKER,0 NEXT POKER,8
2055 IFPP=12THENFORR=8120TO7900STEP-22 POKER,2 NEXT POKER 1 POKE8142,9
 056 PPRINT"[illegible]"
2060 IFPP=14THENPRINT"[illegible]",
2070 IFPP=15THENPRINT"[illegible]"
2080 IFPP=16THENPRINT"[illegible]"
2090 IFPP=17THENPRINT"[illegible]"
2100 IFPP=18THENPRINT"[illegible]"
2110 IFPP=19THENPRINT"[illegible]"
2120 IFPP=20THENPRINT"[illegible]"
2130 IFPP=21THENPRINT"[illegible]"
2400 IFPP=27THENPP=0
2440 RETURN
2450 IFPEEK(8051+A)=32THEN350
2460 IFPEEK(8051+A)=>14ANDPEEK(8051+A)<=17THEN4000
2495 GOTO520
4000 POKE8051+A,SH
4040 FORR=1TO2000 NEXT
4050 PRINT"[illegible]" POKE36069,240 POKE36879,122
4060 PRINT"[illegible]     WELL  DONE!!"
4070 PRINT"[illegible] MISSION  COMPLETED"
4085 PRINT"[illegible]YOU GET"INT(FL*L)"BONUS PTS"
4090 PRINT"[illegible]     HIT A KEY FOR       [illegible]  NEXT  MISSION"
4095 SC=SC+(FL*L) POKE198,0
4100 GETA$ IFA$=""THEN4100
4105 L=L+1 IFL=9THENL=8
4110 GOTO200
5000 FORR=15TO0STEP-1 POKE36877,150 POKE36878,R
5010 POKE36879,4 FORI=1TO50 NEXT POKE36879,12 FORI=1TO50 NEXT NEXT
5050 FORR=1TO500 NEXT LI=LI-1
5060 IFLI=0THEN8000
5070 GOTO210
6000 POKE36079,25 POKE36069,240
8012 IFSC>HITHENHI=SC
8015 PRINT"[illegible]SCORE      HI-SCORE" PRINTSC,HI
8025 PRINT"[illegible]   SPACE  TO  PLAY    "
8040 IFPEEK(197)=32THEN190
8060 GOTO8040
```



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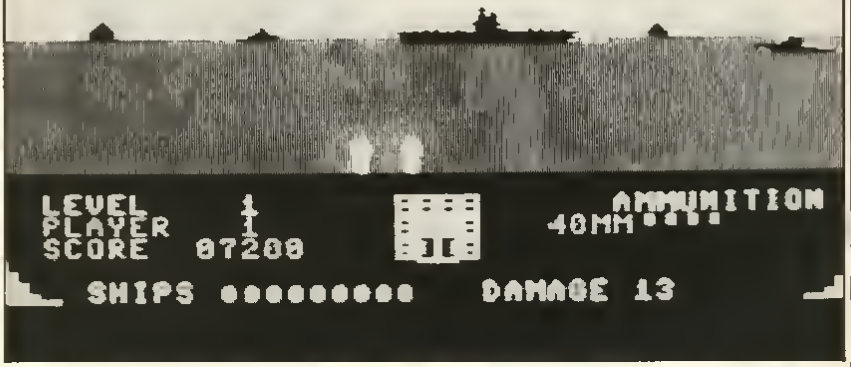
On the beach

Can you establish a beach head, save Esmerelda and go 10 rounds with a boxing champion? Find out in Pete Gerrard's latest games review



DISPROVING the ancient adage that you can't teach an old chip new tricks, Thorn EMI continue to produce some interesting games for the Vic 20 (albeit with 8K expansion)

One of their newer successes is the very good **Tank Commander**, which would have received a 'rave' review, if it wasn't for the fact that my copy of the program managed to crash every time I played it Must be the hot weather

You are in sole charge of a tank, and needless to say your mission is to destroy all the enemy tanks, and in particular you have to keep an eye out for two dumps one ammunition one and one fuel one Destroying those two takes you onto the next level of play, where ever more enemies are out to prevent you completing your mission

Some games do give you the hump while playing them, and **Quasimodo** is one of them An exciting cover to the miniature video box that accompanies the cassette hints at a touch of greatness about the game The description on the back of the cover also suggests that you are about to witness the most amazing game that you've ever seen on a Vic 20 But personally, I found this about as exciting as watching Breakfast TV

Your doubts start to creep in round about the time when the instructions tell you to remove all memory expansion from your Vic, while the cassette informs you that this game requires 8K memory expansion something appears to have gone wrong somewhere, since it does in fact need 8K of extra memory

As Quasimodo, it is your job to rescue the pretty gypsy girl Esmerelda, who is about to be hanged by the wicked Count D'Arcy for refusing his love Since Quasimodo is apparently an ugly mute hunchback, I wouldn't have thought that Esmerelda would have been too pleased about being rescued by him, but there you go

Fifteen different levels of play, it says You have to race across these fifteen different levels in order to reach the spot where the execution of Esmerelda is about to take place With enemy guards after you, fireballs being hurled in all directions, and spears being thrown about the place, this seems to be no easy task

Supplied by Advanced Computer Entertainment, who have produced some interesting stuff for the commodore 64, this is not one of life's gems There's far better stuff around

Revelation

Onto the Commodore 64 now, with **Revelation**, from the company that brought you **Ugh!**, the story of the mad caveman who goes around pinching eggs from pterodactyls Yes, Softek are at it again, and this is another game that is interesting without being outstanding

The cassette cover hints at a game of Ugh-like proportions, depicting ancient lands bathed in moonlight, with flying birds and fire breathing dragons stalking the countryside However, the game itself comes over as a cross between Booga-Boo and Space Invaders

Thirty one different monsters inhabit the forty caverns that you have to traverse before meeting the master Monster itself I hope he's worth the wait, since I never managed to get that far In each cavern are a number of castles which have to be destroyed before you can finish off all the monsters living on that level With a nice graphical touch, everything scrolls around the screen at a reasonable speed as you move around shooting the castles and shooting or dodging the monsters

As far as I'm concerned, Horace can go and take a running jump, since the loveable little imp seems to be getting everywhere these days, and there is such a thing as overkill However **Horace Goes Skiing**, originally a Spectrum game from Melbourne House, has now made the transition over to the Commodore 64

As with some other notable games that have appeared on the 64 after starting life out on the Spectrum, nothing much seems to have changed here You're in charge of Horace, a cute little sprite, who decides to go skiing To do that he must first of all rent his skis (mighty cheap at ten dollars a session) from the local shop on the other side of a busy highway

Using keyboard or joystick you must manoeuvre Horace across the road, watching out for the fast moving motorbikes and the slow moving lorries Cars travel along at an intermediate pace,

and should Horace be unfortunate enough to collide with one of them another ten of your original 40 dollars gets eaten in ambulance fees. Luckily, these collisions are never fatal, and the game only ends when you run out of money. Having got across the road and entered the ski shop. You've then got to get back across the road once more before getting onto the ski slopes themselves.

Here there are few hazards, other than Horace's inability to do as he's told. Trees get in your way every now and again as you race down this slalom course, and a collision with one of them may or may not break your skis, depending on your fortunes at the time. Missing a set of flags wipes some points from your total, and there are also a number of ridges lying around that throw you wickedly off course should you happen to bump into one.

Finishing the course sees you back at the ski shop and set for a trip across the road once more before getting onto the second ski run.

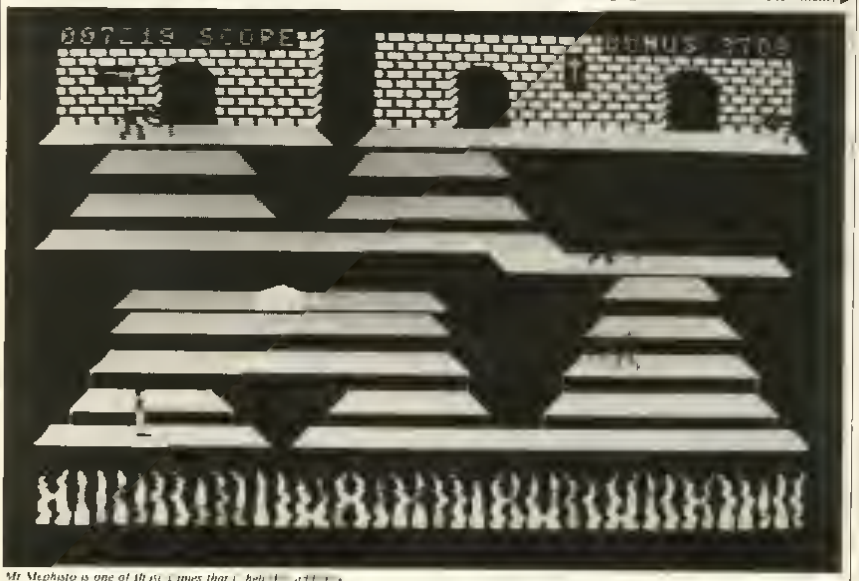
This is only marginally different from the first, and presumably the rest of them follow suit. Should you be unlucky enough to break your skis, you start off on the wrong side of the road again. A little thought on the part of the programmer could have turned this very ordinary game into quite a good one, as a number of silly things seem to have been put into it. For instance, running out of money ends the game, but not instantly. You can spend ages trying to get across the road to the ski shop, thinking that you're actually getting somewhere. Only when you've made the trip are you told that you've no money to hire the skis and the game grinds to a halt.

Galactica 1 — a space battle set against a lurid multi-coloured background

U.S. Gold is a label that is importing a lot of very good American 64 software, and **Beach Head** from Access Software is one of their later efforts. Available on either tape or disk (we had the tape version, unfortunately), it is supplied in this country by Centresoft, who've had the good sense to put it out in turbo load format, or jet load as they prefer to call it.

You are in charge of a fleet of ten ships, whose objective is to reach the shore and land an attack force to destroy the enemy HQ.

In this multi-scene game, the first has you manoeuvering your fleet (represented by 4 little dots) around a harbour. There are two passages into this harbour, and what is referred to as the hidden passage is the one to go for, since this catches the enemy on the hop and means that future levels are a little easier. However, getting through this passage requires a better captain than I, and with the subtlety of a charging bull I rammed the enemy ▶



Mr Mephisto is one of the [illegible]

Revelation — from the company that brought you Eight

◀ fleet head on each time

This brings you to scene 2, where your ship is under bombardment from enemy aircraft, and your only weapon is an anti-aircraft gun. Some stunning graphics here, as your fleet comes under a continuous barrage from the enemy. From time to time a reconnaissance plane flies across shooting that down awards a healthy bonus, but usually distracts you from the task in hand and you lose a couple of other ships.

Relief

This scene seems to continue for ever, and it is a great relief when you finally move onto the next one. Here the enemy ships themselves are firing at you, and moving your gun up and down determines how far your retaliatory shots will travel. A screen read-out shows you your angle of elevation and how far out your last shot was. Since half a degree of elevation is equivalent to 100 metres travelling distance for your shots, you can soon work out what new angle to fire from.

If you manage to emerge from this level with a few ships left, each ship magically changes into two tanks and a spot of land fighting takes place before you reach the enemy Stronghold and the object of the game. According to the instructions you then have to shoot the fortress down on the final level, but this appears to be impossible. I failed every time.

A good and challenging game that is well worth considering by any 64 owner tired of Space Invaders and Adventure games.

Borrowing an idea or two from K-Tel, I G Programs has released a double sided tape for the Commodore 64. One nice touch about this package is that you're told on the cassette inlay card how long the programs take to load, other manufacturers please note.

Galactica 1 is a space battle, which takes place over a lucid multi-colour high resolution background, which sees planets and asteroids of every colour in the rainbow hanging around in mid space. This is presumably there to make the game look visually interesting, since nothing else of note happens. You control a spaceship, which has the unenviable task of saving the universe. The enemy obligingly only send one enemy craft at you at a time, and as far as I could tell that was all there was to do in the entire game. Shoot your opponents, one space ship at a time, and just keep clocking up the points.

Boxing, on side two, was a little better, although it took me quite a while to figure out that the two sprites being used were meant to be aerial shots of two boxers in action: they look quite strange when you first see them.

The idea in this two player game is just to move your boxer around the ring and thump the living daylights out of your opponent. The graphics look quite ridiculous when both players are throwing punches, and it's almost worth buying just to see them in action.

An annoying feature of Boxing is that should you or your opponent be forced onto the ropes, the relevant character is placed immediately back into their own corner, to start again. Points are scored for the number of punches thrown and the number of times that you can force your opponent to hit the ropes, and the best man at the end of ten rounds wins.

A laudable effort to give value for money, but there are much better programs around.

Mr. Mephisto is one of those games that is maddeningly addictive, and one that deserves consideration for a place in your own software library. It's by a new company called euro-byte.

You are trying to reach the gates of Heaven, in the interesting scenario to the game. Unfortunately for you the way to the gates is blocked by demons and fearsome ghouls, and the stairways that you must walk up to progress onto further levels are, like escalators, continuously moving the wrong way. Thus, in your efforts to dodge the demons and keep out of the way of everything else, you forget to carry on moving upwards and the stairs force you back 'into the flaming abyss of Hell', as the cassette cover luridly describes it.

Next level

You control a nicely animated man, and your job is to move him about the place, walking up the moving stairs and avoiding the demons as you go. On each screen there are one or more objects to be gathered, and getting hold of these allows you access to the next level of play.

This description may make the program sound a little like Manic Miner and others of that ilk, but it isn't.

Four speed levels are used (along with three different levels of play), to add interest to the game, and all told this is one of the better new releases for the Commodore 64. ■

Making the most of your 64's memory

*Relocating the character set and moving the screen can make additional memory available on the 64. **David Bolton** explains how to create an extra 1K of ram for programming*

THIS ARTICLE will show you how to increase the memory of your Commodore 64 to almost 40K of ram, an extra 1024 bytes over the normal.

Commodore 64 Basic starts off with the screen occupying ram from locations 1024 to 2047. If we can move this elsewhere then we can alter the start of basic pointers, and gain an extra 1K.

The main problem is that the screen must be moved completely out of the first 40K of memory. The ideal spot turns out to be in the unused 4K of ram from 49152 to 53247.

Because of the way the Vic chip works in banks of 16K, we will also have to move the character set so that it falls into the same bank. This affects sprites, but not badly, and we'll deal with those later.

I have chosen 49152 to 51199 for the character set with the screen straight after that at locations 51200 to 52223.

Changing this from normal is a very simple task as only three pokes are needed. POKE 56576,64 changes the bank that the Vic chip looks at, POKE 53272,32 changes screen and character set positions and POKE 648,200 tells the 64 where the screen is for purposes of writing to it. This last poke is necessary, otherwise the 64 would think the screen was still at 1024 while displaying 51200 to 52223 which is a very confusing situation.

The character set also has to be relocated, so to make life simple I have included a short machine code program (listing one) which moves the complete character set, changes the screen, and all in the blink of an eyelid!

Once you have typed this in, save it before running it. I have included a "checksum" which will tell you if the DATA statements are wrong. If it works correctly it will say

FOR NEW CHAR SET JUST TYPE
SYS 680

When you do this SYS the screen will be full of garbage. Just clear the screen and all will be OK. You can check that the screen has moved by hitting the [HOME] key and putting a * in the top left corner. Now enter POKE 51200,48 and you will see the * change to a 0.

Colour memory is not changed, it is still at 55296. If however you do a RUN—STOP and RESTORE you will get funny letters appearing on screen. Type in SYS 680 (it will look strange but don't stop), press RETURN and all will be as it should be.

Sprites are now altered as to where they are situated. Instead of using locations 2040 to 2047 for the sprite pointers, you use 52216 to 52223. The values in these pointers (0 to 255) now refer to memory locations 49152 to 65535 in steps of 64. POKE 52218,48 will use the sprite pattern at (64*48+49152) = 52224 for sprite two.

Program two is rather large and consists in the main of data statements. This contains a brand new character set for the 64. It has its own pokes for changing memory around so you don't need to use program one first. Just load and run program two.

This only contains half of the character set. The reverse characters are obtained by subtracting each of the bytes from 255. If you don't want reverse characters then you could use the ram from 50176 to 51199 for sprite patterns (numbers 16 to 31), but if you do want them then enter and run this line of Basic

FOR I = 0 TO 1023:POKE 50176+I, 255—PEEK(49152+I):NEXT

Program one copies in a full character set with reverse characters. If you don't want reverse, then change the 16 which is five bytes from the end of line 45 into an eight (8) and alter 10443 in line 20 to 10435.

Now to gain the extra 1K of memory just enter the following line

POKE 64,4:POKE 1024,0:NEW

The first poke changes the start of Basic to (4 * 256 = 1024) and the second sets this to zero otherwise you will get ?SYNTAX ERRORS.

This will lose any program in memory so be careful and save it out first.

If you now PRINT FRE(0) you will get —25603 which really means 39932 bytes free (just add 65536). Now you can have even bigger arrays!

Program 1

```
10 S=680
15 FORI=ST0765:READA:POKEI,A:Z=Z+A:NEXT
20 IFZ<>10443THENPRINT"DATA ERROR":STOP
25 PRINT"FOR NEW CHAR SET JUST TYPE"
30 PRINT"SYS 680"
35 END
40 DATA169,0,141,207,2,169,208,141,208,2,169,0,141,210,2,169,192,141,211,2,173
45 DATA14,220,41,254,141,14,220,165,1,41,251,133,1,162,0,160,16,189,0,216,157
50 DATA0,200,232,208,247,238,208,2,238,211,2,136,208,238,165,1,9,4,133,1,173
55 DATA14,220,9,1,141,14,220,169,32,141,24,208,169,68,141,0,221,169,200,141
60 DATA136,2,96
```

Program 2

```
10 S=49152
20 POKE648,200:POKE53272,32:POKE56576,68
30 Z=0:FORI=0TO1023:READA:Z=Z+A:POKES+I,A:NEXT
40 IFZ<>99738THENPRINT"DATA ERROR":STOP
500 DATA254,130,186,170,180,128,254,0,0,0,116,140,140,142,118
510 DATA0,192,192,254,198,198,198,254,0,0,0,254,192,192,192
520 DATA254,0,6,6,254,198,198,198,254,0,0,0,254,198,254
530 DATA192,254,0,28,50,48,120,48,48,48,0,0,0,254,198
540 DATA198,254,6,254,192,192,254,198,198,198,198,0,0,24,0
550 DATA24,24,24,24,0,0,24,0,24,24,24,24,120,192,192
560 DATA204,216,240,216,204,0,24,24,24,24,24,24,60,0,0
570 DATA0,254,214,214,214,214,0,0,0,254,198,198,198,198,0
580 DATA0,0,254,198,198,198,254,0,0,0,254,198,198,254,192
590 DATA192,0,0,254,198,198,254,6,6,0,0,222,230,192,192
600 DATA192,0,0,0,254,192,254,6,254,0,0,24,126,24,24
610 DATA24,24,0,0,0,198,198,198,198,254,0,0,0,198,198
620 DATA198,108,56,0,0,0,198,198,214,214,254,0,0,0,198
630 DATA108,56,108,198,0,0,0,198,198,198,254,6,254,0,0
640 DATA254,6,56,192,254,0,120,96,96,96,96,96,120,0,12
650 DATA18,48,124,48,98,252,0,60,12,12,12,12,12,60,0
660 DATA0,24,60,90,24,24,24,0,0,16,48,127,127,48,16
670 DATA0,0,0,0,0,0,0,0,0,24,24,24,24,24,0
680 DATA24,0,102,204,34,0,0,0,0,0,102,102,255,102,255
690 DATA102,102,0,24,62,96,60,6,124,24,0,98,102,12,24
700 DATA48,102,70,0,60,102,60,56,103,102,63,0,6,12,24
710 DATA0,0,0,0,0,12,24,48,48,48,24,12,0,48,24
720 DATA12,12,12,24,48,0,0,0,36,24,60,24,36,0,0
730 DATA24,24,126,24,24,0,0,0,0,0,0,0,24,24,48
740 DATA0,0,0,126,0,0,0,0,0,0,0,0,0,48,48
750 DATA0,0,6,12,24,48,96,192,0,254,198,206,214,230,198
760 DATA254,0,24,56,24,24,24,24,60,0,254,198,6,254,192
770 DATA192,254,0,254,198,6,30,6,198,254,0,48,96,192,192
780 DATA204,204,254,12,254,198,192,252,6,6,252,0,48,96,192
790 DATA206,198,198,254,0,254,198,6,12,24,48,96,0,254,198
800 DATA198,124,198,198,254,0,254,198,198,254,6,12,24,0,0
810 DATA0,24,0,0,24,0,0,0,24,24,0,24,24,8,0
820 DATA0,6,24,96,96,24,6,0,0,0,126,0,126,0,0
830 DATA0,0,96,24,6,6,24,96,0,62,6,6,12,24,0
840 DATA24,0,0,0,0,255,255,0,0,0,124,198,198,254,198
850 DATA198,198,0,252,204,204,254,198,198,254,0,254,194,192,192
860 DATA198,198,254,0,252,198,198,198,198,198,252,0,254,198,192
870 DATA240,192,198,254,0,254,198,192,240,192,192,192,0,254,198
880 DATA192,192,206,198,254,0,198,198,198,254,198,198,198,0,60
890 DATA24,24,24,24,24,60,0,6,6,6,6,198,198,254,0
900 DATA198,204,216,240,216,204,198,0,192,192,192,192,192,192,254
910 DATA0,254,214,214,214,214,214,214,0,198,230,246,222,206,198
920 DATA198,0,254,198,198,198,198,198,254,0,254,198,198,254,192
930 DATA192,192,0,254,198,198,198,214,214,254,12,254,198,198,254
940 DATA216,204,198,0,126,192,192,124,6,6,252,0,126,24,24
950 DATA24,24,24,24,0,198,198,198,198,198,198,254,0,198,198
960 DATA198,198,198,108,56,0,198,198,214,214,214,214,254,0,198
970 DATA198,108,56,108,198,198,0,102,102,102,126,24,24,24,0
980 DATA254,6,12,56,96,192,254,0,124,130,186,162,186,130,124
990 DATA0,12,24,48,112,48,24,12,0,0,0,0,6,126,96
1000 DATA0,0,0,0,3,62,118,54,54,0,255,127,63,31,15
1010 DATA7,3,1,0,0,0,0,0,0,0,0,240,240,240,240
1020 DATA240,240,240,240,0,0,0,0,0,255,255,255,255,255,0,0
1030 DATA0,0,0,0,0,0,0,0,0,0,0,255,192,192
1040 DATA192,192,192,192,192,192,192,204,204,51,51,204,204,51,51,3
1050 DATA3,3,3,3,3,3,0,0,0,0,204,204,51,51
1060 DATA255,254,252,248,240,224,192,128,3,3,3,3,3,3,3
1070 DATA3,24,24,24,31,31,24,24,24,0,0,0,0,15,15
1080 DATA15,15,24,24,24,31,31,0,0,0,0,0,0,248,248
1090 DATA24,24,24,0,0,0,0,0,0,255,255,0,0,0,31
1100 DATA31,24,24,24,24,24,24,255,255,0,0,0,0,0,0
1110 DATA255,255,24,24,24,24,24,24,248,248,24,24,24,192,192
1120 DATA192,192,192,192,192,192,224,224,224,224,224,224,224,224,7
1130 DATA7,7,7,7,7,7,255,255,0,0,0,0,0,0
1140 DATA255,255,255,0,0,0,0,0,0,0,0,0,0,255,255
1150 DATA255,3,3,3,3,3,3,255,255,0,0,0,0,240,240
1160 DATA240,240,15,15,15,15,0,0,0,0,24,24,24,248,248
1170 DATA0,0,0,240,240,240,240,0,0,0,0,240,240,240,240
1180 DATA15,15,15,15,195
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COMMODORE SOFTWARE FILE

IT HAS BEEN brought to our attention by Melbourne House, as well as by a number of readers, that two programs published in the August issue of *Commodore Horizons* are not original. The programs (the Star Game Night Pilot, and the Software File entry Sea Copter, are in fact taken from the well-known Melbourne House publication *The Commodore 64 Games Book* by Clifford and Mark Ramshaw. Although we encourage readers to send in programs for the 64 and the Vic for our Software File and Star Game sections, we must stress that programs taken from books and magazines are not acceptable, since the copyright for these programs is owned by the authors/publishers.

Our apologies to Melbourne House and to Clifford and Mark Ramshaw. Obviously we can't keep up with all the listings published in the hundreds of computer books and magazines available — but someone is bound to spot a "ripped-off" program if we publish it. So please remember — original programs only!

Lettersort

Frank Bingley from Market Harborough sends this Vic program

LETTER SORT is an original game in which you have to rearrange the letters in a grid into alphabetical order. You can move the letters using a joystick or the keys W, A, D and Z.

When you have managed to manipulate the letters into the right order, press the fire button or the * sign. If you try to cheat, the computer displays an appropriate message and sound. If you get it right, a fanfare sounds and your time and number of moves is noted.

```
2 BE=100000 BT$="100000" POKE36878,15 D=36876 E=36874
4 DIMG$(5,5),GA$(25) U=30720 V=7680 W=38400 TM=0
5 PRINT"■", POKE36879,25 POKE650,255
6 PRINTCHR$(14)"■■■■■■■■■■■L_||_ ■F_| "
7 PRINT"■■IY _RANK IINGLEY 1984"
8 GOSUB3000
9 PRINTCHR$(142)
10 POKE37151,0 PA=37151 PB=37152 PB=37154
20 PRINT"■CHOOSE GAME-(1 2 3 4)"
21 GETS IFS=0THEN21
22 IFS>4THEN21
30 ONSGOTO31,32 33,34
31 L$="XWVUTSRQPONMLKJIHGFEDCBA" GOTO39
32 L$="EICBAJIHGFONMLKT3R0PANVU" GOTO39
33 L$="AFKPUBGLQVCHMRWDINS/EJOT" GOTO39
34 L$="UPKFAVOLGBWRMNCXSN1DTOJE" GOTO29
39 PRINT"■", Z=1
40 FORX=1TO24
50 GA$(X)=MID$(L$,X,1) NEXTX
60 FOPX=1TO5 FORY=1TO5
80 G$(X,Y)=GA$(Z) Z=Z+1
100 NEXTY NEXTX
102 PRINT"■■■■■■LETTER SOPT■ ■■■■■■■■■■",
110 FORX=1TO5
115 PRINT"■■■■■■" , FORY=1TO5
130 PRINT" "G$(X,Y),
140 NEXTY FRINT FPINT NEXTX
150 FORX=8185TO7701STEP-22 POKEX,102 POKEX+U,4 NEXTX
160 FORX=8164TO8164STEP-1 POKEX,102 POKEX+U,4 NEXTX
170 FOPX=8164TO7680STEP-22 POKEX,102 POKEX+U,4 NEXTX
190 GOSUB300
191 TI$="000000"
195 M=7956
196 IFBE=100000TNENPRINT"■■■■■■■■■■■■■■■■■■■■■■■■■■■■BEST ???" GOTO198
197 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■■■■■BEST "BE
198 IFBT$="100000"THENFPRINT"■■■■■■■■■■■■■■■■■■■■■■■■■■■■BEST TIME ???" GOTO200
199 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■■■■■BEST TIME "MID$(BT$,3,2)":"RIGHT$(BT$,2)
200 A=FEEK(FA) FOKERB 127 B=FEEK(FB) FOKERE,255
201 GETA$ IFH$="W"TNENGOSUB500
204 MI$=MID$(TI$,3,2) SE$=RIGHT$(TI$,2)
205 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■■■■■MOVES ",TM
```

Continued on page 43

SUNSHINE

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Mastercode is a substantial and complex program of use to anyone interested in writing machine code on the Commodore 64. Its features include:

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Address _____

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Signature _____

```
206 PRINT'[illegible]MINS.■"MI$"M:ECS.■"SE$
210 IF(AAND4)=0THENGOSUB500
220 IF(AAND6)=0THENGOSUB400
221 IFA$="Z"THENGOSUB400
230 IF(BAND128)=0THENGOSUB700
231 IFA$="A"THENGOSUB600
240 IF(AAND16)=0THENGOSUB600
241 IFA$="D"THENGOSUB700
250 IF(AAND32)=0THENGOTO200
251 IFA$="*"THENGOSUB800
260 GOTO200
100 PRINT"[illegible]"
210 FOR[illegible]=1TO4
320 PRINT'[illegible]"
330 PRINT"[illegible]'
340 NEXT
350 PRINT'[illegible]'
360 PRINT"[illegible]'
370 POKE7959,42:POKE38673,6
380 RETURN
400 IFM-44<7761THENRETURN
410 P=PEEK(M-44):POKEM,P:POKEM+W,6:M=M-44
420 POKEM,32:TM=TM+1:FORQ=1TO50:NEXT
430 RETURN
500 IFM+44>7972THENRETURN
510 P=PEEK(M+44):POKEM,P:POKEM+W,6:M=M+44
520 POKEM,32:TM=TM+1:FORQ=1TO50:NEXT
590 RETURN
600 IFM<7783THEN610
601 IFM>7817ANDM<7827THEN620
602 IFM>7861ANDM<7871THEN630
603 IFM>7905ANDM<7915THEN640
604 IFM+2<7958THEN790
605 GOTO650
610 IFM+2>7783THEN790
615 GOTO650
620 IFM+2<7827THEN790
625 GOTO650
630 IFM+2>7871THEN790
635 GOTO650
640 IFM+2<7915THEN790
650 P=PEEK(M+2):POKEM,P:POKEM+W,6:M=M+2
660 POKEM,32:TM=TM+1:FORQ=1TO50:NEXT
690 RETURN
700 IFM<7783THEN710
701 IFM>7817ANDM<7827THEN720
702 IFM>7861ANDM<7871THEN730
703 IFM>7905ANDM<7915THEN740
704 IFM-2<7949THEN790
705 GOTO750
710 IFM-2<7773THEN790
715 GOTO750
720 IFM-2<7817THEN790
725 GOTO750
730 IFM-2<7861THEN790
735 GOTO750
740 IFM-2<7905THEN790
750 P=PEEK(M-2):POKEM,P:POKEM+W,6:M=M-2
760 POKEM,32:TM=TM+1:FORQ=1TO50:NEXT
790 RETURN
800 TTT$=TI$:DD=0:FORA=7774TO7956STEP2
801 CC=PEEK(A)
802 IFCC=2COFCC=64OFCC=32OFCC=102THEN803
803 IFCC<DDTHENA=7956:PRINT"[illegible]CHEAT!!!!     ":GOSUB1000
804 IFCC<DDTHENPRINT"[illegible]                    ":GOTO200
805 DD=CC
809 NEXT
820 IFTM>BETHENEE=TM:TM=0
822 IFVAL(TTT$)<VAL(BT$)THENBT$=TTT$
830 GOSUB2000
840 TM=0:PRINT"[illegible]":GOTO20
1000 POKEE,201:FORQ=1TO400:NEXT
1010 POKEE,191:FORQ=1TO500:NEXT
```

Continued on page 45

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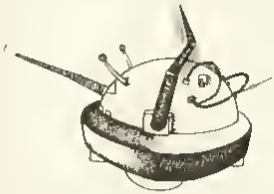

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```
1020 POKEE 207 FURQ=1TO150 NE T
1030 PUKEE 191 FURQ=1TO550 NEXT
1040 POKEE.175 FURQ=1TO1400 NEXT
1050 FOKEE.0
1060 RETUFN
2000 POKED 215 FORQ=1TO400 NEXT FORX=1TO4
2010 PUKED 215 FURQ=1TU50 NEXT
2020 FUKED,219 FURQ=1TO50 NE T
2030 POKED,225 FCRQ=1TO50 NEXT
2050 NE T
2060 POKED 215 FORQ=1TO400 NEXT
2070 POKED.0 FORQ=1TO2000 NE T FETURN
3000 FOFY=1TU4 FOKED.220 FOR =1TU5 NEXT POKED 0 FOR =1TO500 NEXT
3010 POKED,200 FURX=1TO5 NE T FOKED 0 FUR =1TU500 NE   NEXT
3030 RETURN
```

Melody

This Vic 20 program comes from Dominic Gordon Taylor of Reading

MELODY is a music program which makes full use of all three of the Vic's audio frequency generators. The note information is contained in the data statements. Just type the program in and play away!

```
0 GOSU821
1 READA IFR=-1THENPOKE36876,0 POKE36874,0 POKE36875,0 GOTO24
2 POKE36876,A R=R+1 IFR>3THENPOKE36875,A R=0
3 FORT=15TO5STEP-.4 POKE36878.T NEXTT POKE36874,0
4 POKE36875,0 U=U+1 IFU>5THENPOKE36874.A U=0
5 GOTO1
6 DATA195,195
7 DATA195,195,195,195,195,195,195,207
0 DATA201,195,201,195,201,195,191,183
9 DATA191,183,191,183,207,183,179,183
10 DATA207,207,195,195,201,204
11 DATA201.195,195,201,204,215,201,204
12 DATA195,215,215,209,207,207,204
13 DATA207,207,204,207,207,204,207
14 DATA215,207,215,209,201,201,201,199
15 DATA201,201,199,201,209,207,201,207
16 DATA215,215.219,219,201,204,207
17 DATA207,204,207,209,207,201,191,201
18 DATA195,195,195,191,195,204,201,195
19 DATA215,195,201,207,215,195,201,207
20 DATA215,195,207,201,195,-1
21 PRINT"J  MELODY BY D.TAYLOR "
22 PRINT"■   ON ANY COMMODORE   "
23 PRINT"■         VIC-20" RETURN
24 PRINT"■■■  ANOTHER SPIN (Y/N)" POKE190,0
25 GETA$ IFA$=""THEN25
26 IFA$="Y"THENRESTORE GOTO0
27 IFA$="N"THENSYS64802
20 PPINT"■         PARDON"
29 FORT=1TO1000 NEXT RESTORE PRINT"■" GOTO0
```

Meteors

A program for the unexpanded Vic 20 from Andrew Lovatt of Newcastle

METEORS was published in our August issue with several lines cut off the end. Our apologies to those of you who couldn't understand why it didn't work! Here are the missing lines. Send us an s a e if you want a full listing

```
730 RETURN
800 PRINT"J■■■■■YOU SCORED",SC POKE36879,27 PRINT"■■DO YOU WANT ANOTHER GO"
810 INPUT"■■■■■■■(Y/N)",AN$
820 IFAN$<>"N"ANDAN■<>"Y"THEN800
830 IFAN$="Y"THENRUN
840 PRINT"■J" POKE36079,27 POKE650,0 END
1000 POKE36878 0 PRINT"J"
1005 PRINT"■■■■■■■*****************      *                *"
```

Continued on page 46

```
1010 PRINT"■■■METEOR ATTACK *      *                    *"
1020 PPINT"■■■BY A.LOVATT   *      *                    *"
1030 PRINT"■■■STAFFORDSHIRE *      *                    *"
1040 PRINT"■■■FEBRUARY 1984 *      *                    *"
1050 PRINT"■■*****************"
1060 PRINT"■■■    DO YOU REQUIRE       INSTRUCTIONS (Y/N)"
1070 GETIN$ IFIN$=""THEN1070
1080 IFIN$<>"Y"ANDIN$<>"N"THENRUN
1090 IFIN$="N"THENRETURN
1100 PRINT"■"
1110 PRINT"■■■■■INSTRUCTIONS                    ———————"
1120 PRINT"■■■YOU (■■■) ARE IN OUTERSPACE AND ARE BEING"
1130 PRINT"■■INVADED BY METEORS    WHICH FLY AT YOU FROM RANDOM POSITIONS."
1140 PRINT"■■YOUR JOB IS TO KILL THEM BEFORE THEY REACHTHEIR TARGET.YOU SCORE"
1150 PRINT"■BY SHOOTING THEM BUT  YOU LOSE A LIFE IF "
1160 PRINT"THEY MANAGE TO PASS    YOU.YOUR LIVES DEPEND ON THE SKILL LEVEL YOU"
1170 PRINT"■■CHOOSE.1=1 LIFE  2=2LIVES ETC. UP TO 5"
1180 PPINT"■■■■PRESS ANY KEY"
1190 GETA$ IFA$=""THEN1190
1200 PRINT"■■*** METEOR ATTACK ***"     "
1205 PRINT"■■■■■■■■CONTROLS..."
1210 PRINT"■■■■■■■■■■A-UP■■■■■■Z-DOWN■■■■■■■■.-FIRE"
1220 PRINT"■■■■■■■■■■PRESS ANY KEY"
1230 GETA$ IFA$=""THEN1230
1240 RETURN
```

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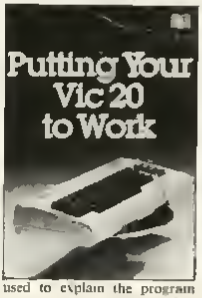
Working Vic

Book: *Putting Your Vic20 To Work*
Author: *Tom Lau*
Publisher: *Interface*
Cost: *£4.95*
Reviewer: *David Shepherdson*

This book is well laid out and well printed. The 15 programs are taken from a printer listing and use is made of character codes rather than the control codes, which makes the programs easier to type in. All the programs should fit into the unexpanded Vic and, as there is not one PEEK or POKE throughout the book, they would also transfer straight into the C64.

The best parts of this book are not the programs themselves, which are generally short and elementary, but the accompanying pages of explanations. The book starts with an introduction on how to use the book, then follows with a chapter on algorithms. In this chapter truth tables for logic gates are encountered, not in binary format of (eg) *1 AND 1 = 1*, but as question and answer tables.

In chapter 3, Pseudo-Coding crops up, not as used in Assembly language, but as



used to explain the program steps. Each of the following chapters consist of a program, a list of variables used, a line by line explanation, the 'pseudo-codes' then what they mean, the vocabulary of statements etc used, and finally a few exercises for you to do.

This book is aimed at someone who has mastered the user's manual and wishes to go just a little further. All the programs can be improved by you as none use any sound, colour or character colours.

Beginner's Basic

Book: *Commodore 64 — Vic 20 Basic*
Author: *Richard Haskell & Thomas Wandeknecht*
Publisher: *Prentice Hall*
Cost: *£12.55*
Reviewer: *Osman Durram*

Prentice Hall's publication *Commodore 64 – Vic20 Basic* is a somewhat plodding beginner's book that never graduates to anything beyond the 'learning to peek and poke' level. It looks very much as though it was written specifically for introductory programming courses in US high schools and junior colleges, hence the emphasis on producing pleasing geometrical patterns, graphs, and the Stars and Stripes.

Its principal limitation is that the authors remain firmly wedded to the idea that the most interesting things you can do with a micro must involve abundant use of the graphics characters. So, before introducing such fundamentals as the PRINT statement, they have you drawing diamonds and undulating tram-lines all over the screen, and it is not long before you start producing little man on skis and writing your name in three dimensional characters across your ever-patient monitor. Which is all very well, of course, but what about the sprite?

This, alas, is where the authors let you down, and for a very obvious reason. Since nearly all the algorithms are intended for use on both the Vic20 and the Commodore 64, there is very little space (only a couple of appendices, in fact) for any features peculiar to only one of the two models. What this means is that Commodore 64 users bent on exploiting their machines to the full are liable to feel that they have been robbed of most of the £12.55 they had to shell out for this book.

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9) Which company has Commodore's ex marketing manager John Baxter recently joined?
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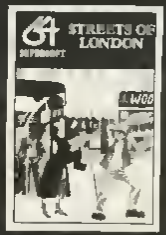

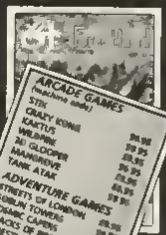

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ANSWER BACK

Spinning reels

I'VE WRITTEN a program in Basic to represent a fruit machine. The program uses PET graphics for six different symbols, and the RND function to pick one at random. The program runs OK, but at the second 'spin' of the 'reels' the motor in my datasette starts, although it had stopped after loading. The only way to stop it seems to be RUN – STOP.

Although it doesn't affect the operation of the program in any way, I'd appreciate it if you could tell me how to stop this happening.

P Dent
Seaham
Co Durham

THE REASON must be that you are POKEing values in a computed location, and one of three locations is the one which enables the cassette motor. Bit 5 of locations 0 and 1 control the motor, e.g. POKE 1,15 to turn motor on, POKE 1,55 to turn motor off.

Simons suggestion

I HAVE recently bought a 1520 printer, Simons Basic and disk drive. Everything works apart from the Simons Basic printer commands COPY and HRDCOPY.

It appears that these commands are set up for device 4, but the printer is device 6 — can you tell me how to change the device number. I would prefer a hardware rather than a software solution.

Lastly, some programs will not load with Simons Basic plugged in — why is this?

P J Monk
Dartford
Kent

INFORMATION on how to change the 1520's device number is given on page 4 of the manual at 2b — "hardware method". The reason why some programs will not load is that they attempt to use the same memory areas as Simons Basic. The only way around this is to change the memory location of your machine code programs. If they are commercial programs this would be pretty difficult!

Sequential files

I OWN A 64 with a disk drive, but after hours of thought I have come to a dead end. I find it impossible to write a sequential file program that lets you write a file, then call it up at any time so you can add to it (not rewrite it, as I have had to do.) Please can you supply a solution?

Michael Whittaker
Beeston
Nottingham

IF YOU WANT to change data in a file without rewriting the entire file, then you will have to use Relative Access files, in which you can access any part of the file without having to read in and process all of the preceeding data.

You can find useful information in August's *Commodore Horizons*, or in a book called *Mastering the Commodore 64* by Jones and Carpenter, published by Ellis Horwood. There are two books by this title, so make sure you get the right one.

Curse the cursor

I OWN A 64 and find the flashing cursor a bit demanding. Is it possible, with the use of a small program, to replace the cursor with a friendlier single line version?

J Cleverly
Northfield
Birmingham

THE FLASHING cursor is not a character but an area changing from normal to reverse at the memory location where you see it.

Press CTRL and RVS ON then the space bar, and you'll create a reverse bar across the screen. Place the cursor on that line and you'll see a flashing blue cursor. In program mode you won't have any problem, since the cursor is normally off and you can program any character you want to replace it. In direct mode you will have to divert the CHRGET routine to one of your own, which will put the character you require at the cursor location.

1541 copy routines

I HAVE recently acquired a second 1541 disk drive and would welcome a program which would copy disks block by block using both drives.

I appreciate that it's possible to copy a disk using both drives and the Copy-all 64 program, but this does not give an accurate block to block copy. The only other method which will give a true copy is the D option on the 1541 backup program. However, this is a slow and time-consuming operation needing constant attention to change the disks.

D Mills
Luton
Beds

TRY "The Clone Machine", which is available from Micro-Ware Dist. Inc. of PO Box 113, Pompton Plains, NJ 07444, USA. This caters for a number of combinations of different drives.

Ain't no monitor

WHILE at school I discovered that typing SYS 1024 on the PET 4016 would enable the machine code of the present program to be accessed. I was then able to write a short renumbering program.

On checking this on the Vic 20 I found that this SYS number would not work. Could you give me the relevant SYS number?

M Wilkes
Birmingham

Neither the Vic or the 64 has a machine code monitor such as that built into the PETs. So your SYS cannot enter a non-existent monitor. You can, of course, SYS to a location which contains a ROM routine (such as RESET) and the machine will then execute that routine.

There is a free public domain machine code monitor called Micromon which is available to all ICPUG members.

Time delay

I CANNOT find the way to produce a time delay of exactly one second on the 64. Can you help?

Gordon Pennie
Carterton

USE ti$ for your timing as follows,

```
10 PRINT "CLR". TI$ = "000000"
20 PRINT "HOME" TI$
GOTO 20
```

You will see that TI$ corresponds to hours, minutes and seconds, and you can also easily set TI$ to the correct time of day (on the 24 hour clock) by using either direct mode or program mode. TI$ is not reset by RUN, unlike other variables.

Direct mode, TI$ = "163040" then press RETURN at the right time. Program mode, use input a$ ti$ = a$, press return at the right moment.

Code and colours

IS IT possible to stop all machine code programs from auto-running?

Is it possible to mix colours or change luminance levels on the 64?

Cassan Harvey
Derby

MACHINE CODE programs which autorun usually do so for reasons of copyright protection, so it would not be appropriate for us to give advice on this question.

The new C16 and Plus – 4 have controllable luminance levels, though not colour mix.

If you need help with a technical query or problem write to Jack Cohen, Commodore Horizons 12-13 Little Newport Street, London WC2R 3LD

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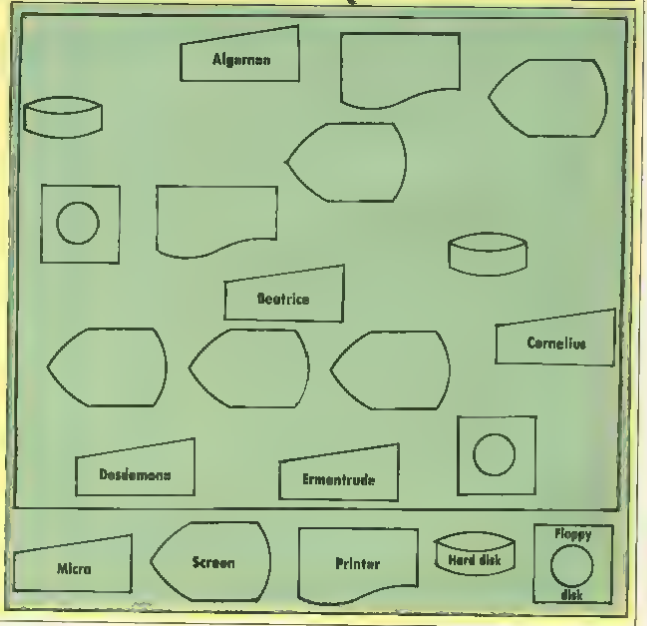

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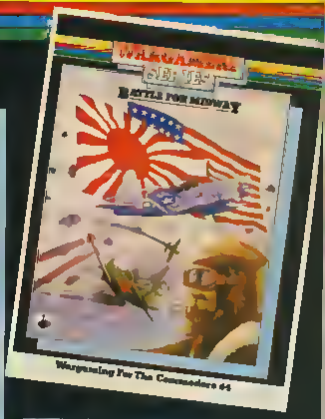

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BATTLE FOR MIDWAY

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THE GAME
'Battle For Midway' is not a simple game. It has been designed for the person who enjoys a stimulating intellectual game and incorporates every realism to ensure that whatever the outcome of the game - that is the way it could have happened.

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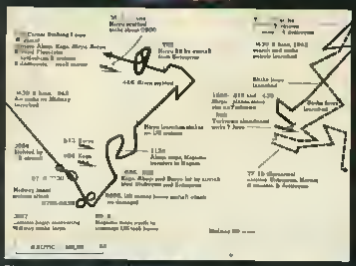
THE AUTHOR
Alan Steel is one of the original UK wargamers and has been playing and designing wargames for nearly twenty-five years.



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